Health behaviour in a social and temporal context

Catherine Mary Schooling

University College, London

Ph. D, Epidemiology

Abstract

Smoking, alcohol consumption, diet and exercise are sources of risk for many chronic diseases and the need to change unhealthy behaviours is now a key aspect of health promotion policies. Interventions to change adult behaviours have been unsuccessful despite, or perhaps because of, rather dramatic secular changes.

Health behaviour is usually understood in terms of three different motivating forces for action, which can be categorised as individual utility, social structure and agency (i.e. engagement in a specific social and temporal context). The first two of these have been relatively well studied. The role of individual utility has been explored using a variety of expectancy-value models that relate individual psychological attributes (attitudes, beliefs and suchlike) to health behaviour. The role of social structure has been explored by studying how behaviour varies with economic circumstances (such as income or tenure) and social relationships (such as family and neighbourhood). Less well studied has been the role of agency.

This thesis develops Giddens's concept of self-identity and Simmel's ideas on fashion, to provide an operationalisation of agency. The concept of image is used to link the individual's presentation of self and the appearance of an activity, in terms of underlying attributes such as conformity, gender-identity, sociability and asceticism. Considerations of image provide a potential explanation as to why some people might be more attracted to one activity than another. The concept of status seeking is used to explore why some people are motivated to follow new trends more quickly than others.

This operationalisation of the role of agency in health behaviour is tested by exploring the relationship between all these potential motivating forces (individual utility, social structure and agency) and the initiation of and change in 4 specific health behaviours (smoking, drinking, diet and exercise), using data from the 1946 national birth cohort The 1946 cohort provides a unique opportunity to explore these relationships because it provides the historical specificity necessary to delineate the changing public image of these health behaviours. It covers a period (1946-1989) during which advice about and the public image of the 4 health behaviours changed considerably, and it has data on the cohort's health habits and self images. Results indicate that people's views of themselves in relation to public images do indeed relate to these 4 health behaviours along with the other motivating forces. Understanding how all these motivating forces operate offers the possibility of predicting future behaviour and designing strategies to promote healthy choices.

Acknowledgements

I would like to thank my supervisor Professor Michael Wadsworth for all his help and encouragement in developing the ideas in this thesis, and for his support throughout, without which this thesis would never have been completed. I would like to thank Dr Rebecca Hardy for all her practical advice and guidance. Finally, I would like to thank my family for their help and forbearance, in particular my husband, John, for his proof-reading, his father, the late Professor Tom Burns, for telling me whatever I did was not good enough, and my children for putting up with it

Contents

Contents - Appendices

Contents - References

Figures

Tables

Tables - Appendices

1 INTRODUCTION

1.1 Why study health behaviour

Adult health behaviour contributes to many chronic diseases (McGinnis, Foege, 1993). Improving health behaviour is a key strand of government policy aimed at reducing the burden on social and medical services whilst improving quality of life (DHSS, 1978), (DHSS, 1984), (DoH, 1992), (DoH, 1999). How to intervene effectively is a key public health issue (Ebrahim, Smith 1997), (Tudor Smith et al, 1998).

Clearly, it is most worthwhile to look at habits which could have most effect on public health. Ideally, these habits should be widely prevalent and causally related to poor health outcomes. In terms of understanding the effect of health promotion, it is only worthwhile to look at habits where there has been some attempt to change behaviour, e g. diet rather than sleeping habits.

The Health of the Nation (DoH, 1992) highlighted smoking, fat-intake, alcohol-intake, exercise and screening attendance as the key health behaviours for reducing coronary heart disease and cancers. This was alongside other concerns with social issues and social order (mental health, sexual behaviour and accidents), and against a background of mounting evidence that altering lifestyles does not have as much effect on mortality as hoped (Oliver, 1992), (Ockene et al, 1991), (MRFIT, 1990), (MRFIT, 1982), (Ebrahim, Smith, 1997), that stopping smoking is the most effective (Rose, Colwell, 1992) and that it is not obvious that alcohol intake is a risk factor for heart disease (Marmot, Brunner 1991). Nevertheless, The Health of the Nation (DoH, 1992) reflects long-standing perceptions of healthy behaviour, which are relevant for understanding contemporaneous health behaviour, regardless of whether they make a difference. In the future, there could be other key health behaviours - for example, the inter-generational effect of health related behaviour in pregnancy (Barker, Martyn, 1992), which it may be useful to improve.

In late 20th century Britain smoking, alcohol intake, diet and exercise were chosen as the health behaviours to study, as these are rooted aspects of lifestyle, which present a challenge to health promotion and which are well known to the public as being relevant to health. Other possible measures of a 'healthy lifestyle' such as not eating between meals, or regular sleeping habits were not considered because they are not well known, promoted aspects of a health lifestyle. It would be unreasonable to expect people to be performing them as a health enhancing behaviour

1.2 National Social trends in health related behaviour

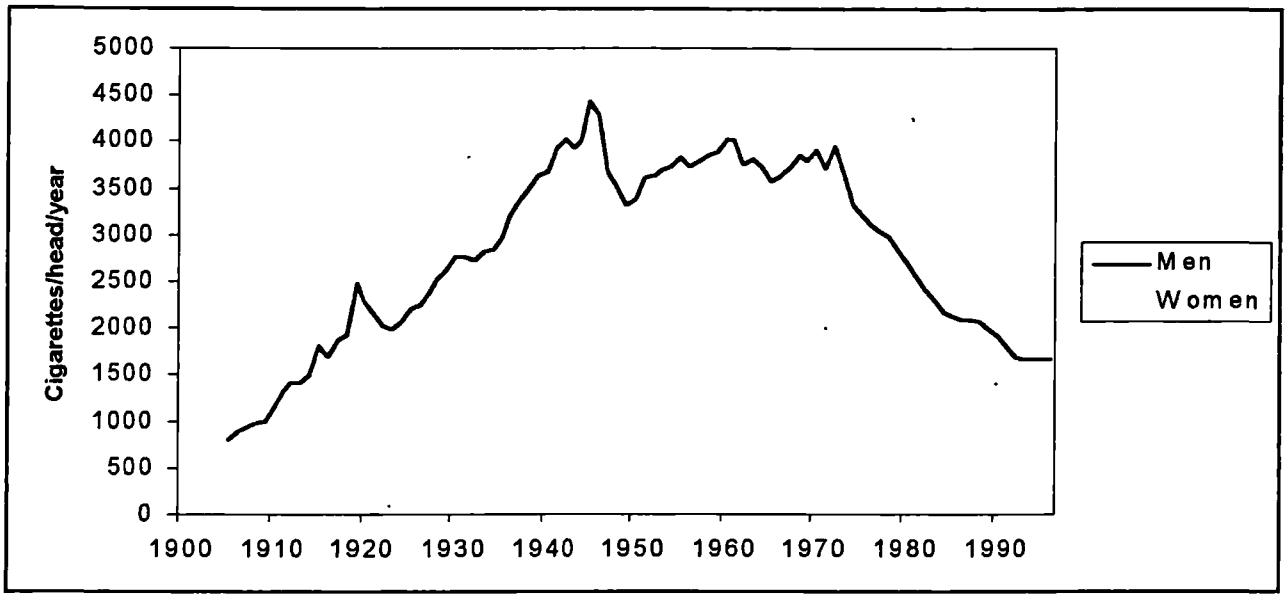
For several reasons - taxation, ease of quantification, 'moral' concerns, social order – data on secular trends for smoking, drinking and diet in Britain in the 20th century are available Exercise trends are less easy to discern, as it is hard to measure and less important from a fiscal or social point of view.

Figure 1.1 shows estimated annual consumption of cigarettes per adult for 20th century Britain The figures for 1905-72 are based on sales of manufactured cigarette in the UK (Todd, 1959), (Todd, 1975), and count adults as 15+. The figures for 1974 to 1996 are taken from the General Household Survey (ONS, 1998a), so are based on the behaviour of a sample of the British population (i e excluding North Ireland),

and count adults as 16+. Though these sources should overall be comparable, the change of sources may overstate the decrease between 1972 and 1974. Cigarette consumption does not equate to tar or nicotine consumption (Todd, 1975). Tar and nicotine consumption may have gone down faster (Charlton, Murphy, 1997), with changes in the composition of cigarettes and the introduction of low tar cigarettes by the tobacco industry in the early 1970s, in an effort to make smoking look safer.

Men started to smoke cigarettes in large numbers 30 to 40 years before women did. Men's consumption rose sharply in World War I (WW1) and World War II (WW2). Women's also rose in WW2. The downturn caused by the 54% increase in tobacco duty in 1947 is clear to see. Men's consumption peaked in 1944 about 30 years before women's peaked in the 1970s. Men's smoking has been on the decline throughout the last half of the 20th century and women's for the last quarter of the 20th century.

Figure 1-1: Cigarette sales in 20th century Britain



Source: Todd (1905 - 1972) and ONS (1972 -1996)

Information about the dangers of smoking has been officially disseminated in Britain since June 1957 (Ministry of Health, 1958), after some initial reluctance (Central Health Services Council, 1957). The health message has generally been 'give-up smoking' (Burn, 1960) (HEC, 1970), even if the industry message may have been 'carry on smoking milder cigarettes'. So, the decline in men's smoking started before Doll and Hill's first paper on the health dangers of smoking was published in Britain in 1950 (Doll, Hill, 1950), let alone the start of health education. There is even specific evidence of a decline in men's smoking between 1948 and 1952 (Todd, 1966). Men's smoking also appears to have declined at a faster rate than women's did, and to have been more effectively changed, so that girls caught up with boys smoking in about the mid 80s (McGuffin, 1982), (McNeill et al, 1988). The focus recently has been on women's smoking (Swan et al, 1989), (DoH, 1999).

Figure 1-2: Alcohol sales in 20th century Britain

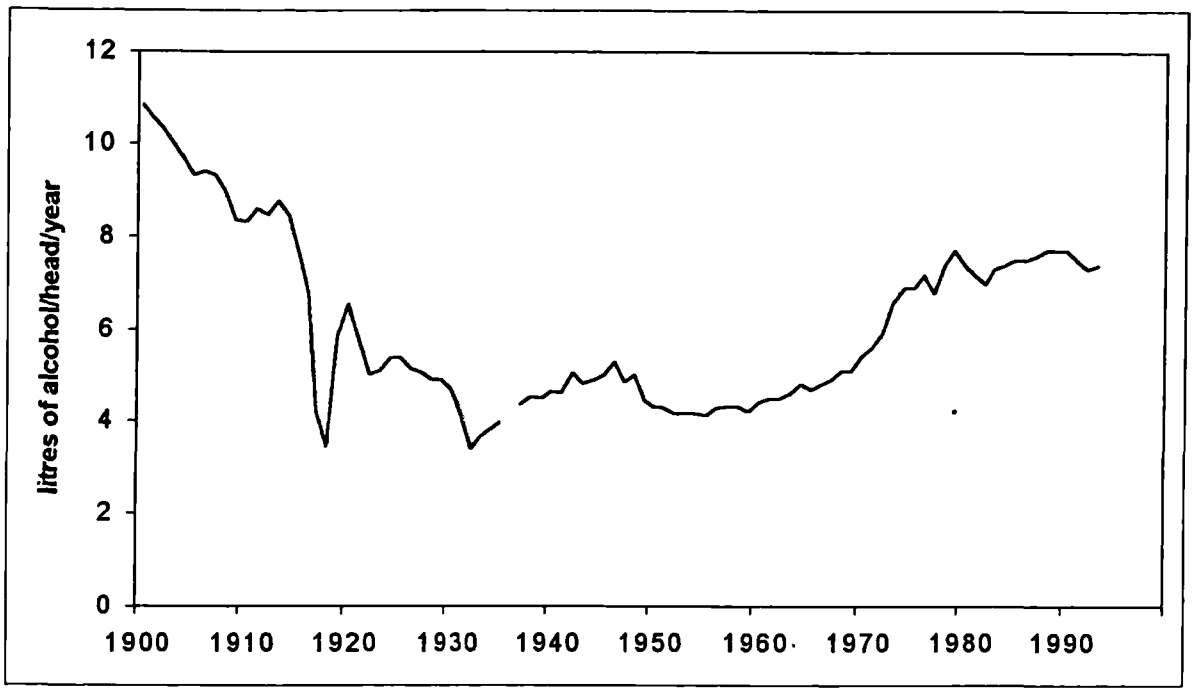


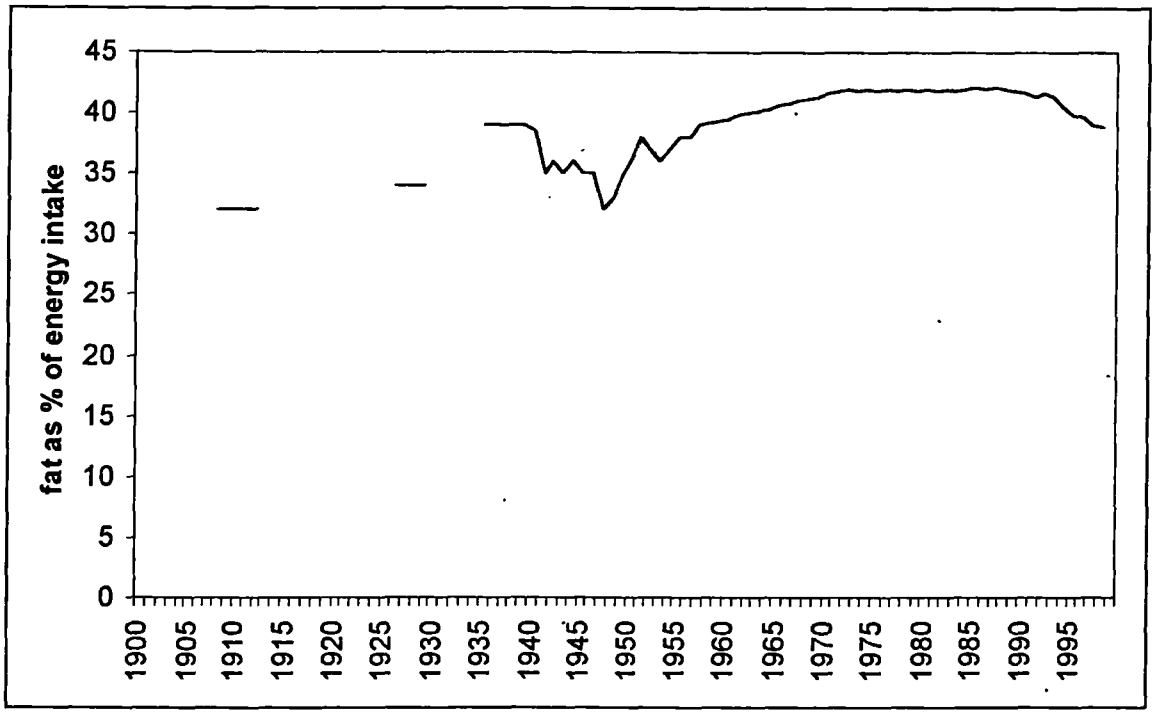
Figure 1.2 shows litres of alcohol consumed per head for 20th century Britain. The figures are based on UK sales (Williams, Brake, 1980), so it includes per head figures for Eire until 1922. This is unlikely to make much difference, as the population of Eire was 6.3% of the United Kingdom population in 1921 (Board of Trade, 1921), (Board of Trade, 1931). The conversion into absolute alcohol could introduce slight inaccuracies as the strength of drinks varies, but it is unlikely to explain away the large-scale changes in both directions. It masks different trends for men and women, whose separate drinking habits have not been quantified over the long term.

Alcohol consumption fell sharply at the beginning of the 20th century, particularly during WW1. There was another dip during the depression of the late 1920s and 1930s. A steep increase from the late 1960s onwards led to consumption reaching pre-WW1 levels again in the 1980s and then levelling out, during a period of record post-war unemployment almost at the same levels as in the depression during the 1930s (Layard et al, 1994). Since the late 1970s there have been campaigns on reducing drinking (Caruana et al, 1978), (DHSS, 1981), (Linthwaite, 1987), culminating in the first National Drinkwise Day in June 1989 (McGuire, 1988), so it is not clear what is cause and effect here.

It is noticeable that over the 20th century drinking and smoking appear to show almost opposite peaks and troughs, as if they are alternatives. In fact in WW1 it is quite possible that people were implicitly encouraged to see smoking as an alternative means of relaxation to drink. Controls were introduced on the sale of alcohol from 1914 onwards (Williams, Brake, 1980). Prohibition was mooted in 1916 (Williams, Brake, 1980). Government posters explicitly discouraged drinking: 'Lord Kitchener appeals to everyone: avoid treating the men to drink' (Williams, Brake, 1980). On the other hand retail prices for tobacco products were fixed from June 1917 to January 1919, and the government suffered losses on tobacco duty where necessary (Board of Trade, 1919).

Figure 1.3 shows fat as a percentage of energy intake for 20th century Britain, thus allowing for changes in energy intakes over time. Data for the first half of the century is sketchy. Since 1950, the National Food Survey has provided consistent, representative information on household food purchasing for mainland Britain, and for Northern Ireland since 1996. In the first half of the 20th century, there were a considerable minority for whom food intakes were insufficient (Boyd-Orr, 1937), and the overall trend until WW2 undoubtedly represents better nutrition for many. The problems of supply during WW2 and until rationing ended in 1954 are clear to see. This was followed by a gradual upward trend, which flattened out in the 1980s and started to decline in the 1990s. This overall trend between 1960 and 1985 is substantiated by meta-analysis for the UK (Stephen, Sieber, 1994). The overall trends and percentage fat intakes (for 1930-1985) are similar for men and women (Stephen, Sieber, 1994).

Figure 1-3: Fat intakes in 20th century Britain



Source (DHSS, 1978), MAFF (1991), MAFF (1999)

Since the late 1970s at least there have been campaigns on diet (DHSS, 1978), backed up highly publicised reports in the early 1980s (HEC, 1983), (DHSS, 1984). At a population level the impact of health education is hard to detect, other factors such as the unemployment in the 1980s could also have played a part.

Overall, trends in total physical activity can be gleaned for energy intakes and obesity levels. Overall, energy intakes have declined since WW2, while obesity has been on the increase since at least 1980 (Charlton, Murphy, 1997). This would suggest that activity levels must have been declining, but whether this lower activity is due to external factors such as the demands of jobs or unemployment or whether it is due to lifestyle choices is less clear.

Concern over physical fitness in the late 1930s resulted in the Physical Training and Recreation Act, passed in 1937 and aimed at achieving a higher level of fitness (Gratton, Taylor, 1991). Exercise has generally been seen as desirable. (NCB, 1970) However, it was only gradually recognised as contributing to health (Menotti, Seccareccia, 1985), (Davey-Smith, Morris, 1992). It has been recommended as beneficial to health since at least the 1970s, (DHSS, 1978). It was promoted via Fun Runs (Rees, 1980), (Linthwaite, 1985), as part of the heart health campaigns (Heartbeat Wales, 1987) and the Health Education Council (Fentem et al, 1988). However there is little evidence of activity levels increasing (Prentice, Jebb, 1995).

1.3 The Necessity of seeing Health behaviour in context

Clearly, health related behaviour is not a simple question of listening to the message and taking appropriate action. In the first place, action may precede the message, secondly the message may not be understood and thirdly there is how the message fits into the existing social world –with its structural constraints, notions of social acceptability, cultural values and suchlike. It is clear that in gross terms in 20th century Britain secular change was related to external events, such as WW2. The question for epidemiologists is why does demand change and how can it be influenced. This is a question of both individual motivation and how health habits evolve in the social world. 'The public health viewpoint requires the link to be made with the social or cultural environment, with the ultimate aim of seeking factors that can be changed' (Marmot, 1981). It seems necessary to recognise 'that the most efficient method of mass behavioural change is to change the norms of behaviour - in short to change culture itself.' (Davison et al, 1991).

Before discussing how structure and values in society relate to behaviour in a range of academic disciplines (chapter 2) and how theories from these disciplines can be used to understand and predict health behaviour (chapter 3), this introduction sets the scene by discussing change in late 20th century Britain, how it relates to health behaviour and the data that can be brought to bear on the problem. This discussion focuses on the second half of the 20th century, though relevant prior events are included, e.g. the start of a long-term trend. It is a period of substantial change both in ideas on health behaviour, and the social acceptability of some health behaviours. Many of those who have lived through that period are still alive and potentially could yet benefit from changing. Finally there is detailed data available, which enables a better understanding of the social context and its relation to behaviour.

1.4 Social Change in Britain

World War II from 1939-1945 could not fail to act as a social catalyst, breaking down old barriers, providing opportunities and creating a feeling of community, with expectations of social justice and a better future. In 1946 Britain was setting up a social framework that provided for everyone. commitment to full employment, the 1944 Education Act, the introduction of the Health Service in 1948, the New Towns and the housing programme. These innovations did not level classes and earnings (Smith, 1986), nor did they provide equality of opportunity and access (Halsey, 1995) Nevertheless, it would be hard to argue that they did not represent a real improvement on the recent past, or provided new opportunities. For example, there are many from this post-war generation who were the first in their family to go to university.

It is not easy to encapsulate societal change in the second half of 20th century Britain. However ignoring the political ones such as loss of empire or small-scale wars, there are some large-scale social changes concerning education, wealth, the role of women, the role of authority and social structure Specifically there have also been changes in the relative accessibility of cigarettes, drink, diet and exercise.

1.4.1 Education

The second half of the 20th century has seen an enormous expansion in education driven by a need for a more technically trained and qualified workforce. For example in the early 1960s 4% of the potential entrants went to university and 8.5% to some form of higher education (Halsey, Webb, 2000). By 1971 the numbers in some form of higher education had almost doubled to 14%, and since 1989 it has gone up steadily from that level to over 30% (Cook, Stevenson, 1995). The expansion of women's participation in higher education has taken place later than men's; the proportion of women in higher education was 26% in 1963 and was nearer equality (46%) in 1989 (Obelkevich, Catterall, 1994), (Cook, Stevenson, 1995).

From a naïve perspective, a more educated population might be more likely to respond to health education campaigns. On the other hand it could help widen divides if education orientated health behaviour campaigns result in the more educated changing first. The difference in educational achievement between men and women born in the mid 20th century provides an opportunity to investigate the role of education.

1.4.2 Income

An overall increase in purchasing power since 1950 is almost too obvious to mention, and can easily observed in the increase in cars, domestic goods, foreign holidays and many more items (Obelkevich, Catterall, 1994). Between 1950 and 1990 disposable income rose by a factor of three compared with prices (CSO, 1992). In broad terms the relative distribution of post-tax income changed slightly towards greater equality between 1949 and 1979 (Field, 1983), (Hills, 1996). Since 1979, post-tax income and wage inequality has increased substantially (Aghion, Williamson, 1998) (Hills, 1996) resulting in greater stratification and greater relative poverty, especially for those in non-working households. In the early post-war period (1945 and 1974) there were unprecendently low levels of unemployment, below 2% till 1960 and below 3% till 1971.However much higher unemployment occurred in the 1980s, with the peak at 13% in 1982, and unemployment remained over 10% till 1987 (Halsey, Webb, 2000).

Greater purchasing power may make it easier to smoke, drink, eat a healthy diet and take part in sports. On the other hand creating a culture of inequality ' which is less supportive, more aggressive and usually more macho' (Wilkinson, 1999) may not be conducive to looking after yourself.

1.4.3 Role of women

At the start of the 20th century, women had little political or economic power and a role almost entirely confined to the home. Gradually women obtained more rights There was entry into the professions in 1919 (Sex Disqualification (Removal) Act), full franchise in 1928 (Equal Franchise Act), removal of some marriage bars in teaching (1944) and in the civil service in 1946, rights to family assets in 1969 (Matrimonial Property Act), equal pay in 1970 (Equal Pay Act) and equal opportunity in 1975 (Sex Discrimination Act). This is not to say that progress was uncontested or uninterrupted or that these rights

had immediate effect, or that all women wished to take advantage of them. For example the 1950s saw a re-emphasis on women's role as mothers in the home following Bowlby's report 'Maternal Care and Mental Health' for the WHO in 1951 (Bowlby, 1952). Nevertheless, women's participation in the workforce increased to 43% in 1991, from 29% in 1951 (or in fact 1911), even if it was poorly paid part-time work. Women's pay (ONS, 1998b) and representation in senior positions (COI, 1996) is still lower than men's.

Women's emancipation provided greater access to money and emancipation from constraints on acceptable female behaviour, so that drinking, smoking and having muscles all became more socially acceptable for women. Despite women's responsibility for family health (DHSS, 1976), it has also become more acceptable for men to take an interest in their own health and appearance, to wit introduction of men's lifestyle magazines such as GQ or FHM.

1.4.4 Authority and deference

For many the 'swinging' 60s are seen as a time which for good or ill broke the mould and caused a seismic change in attitudes. In the 1950s, social commentators remarked on the appreciation for authority (Browne, 1950), e.g. the police (Gorer, 1955). Historians writing on the 1960s have a tendency to remark on an end to deference. 'British society seemed to have broken out of the straitjacket of dullness and conformity' (Marwick, 1996). 'The 1960s were socially fluid and deference was definitely on the wane' (Rowbotham, 1997). Whilst previously the welfare state had 'also retained many of the old structures of authority and deference' (Rowbotham, 1997). There certainly appears to be plenty of evidence of people wresting back power; direct action by CND starting in the late 1950s, RD Laing asking why individuals accepted repression and authority from the state, the emergence of a pressure and campaigning groups. the sit-ins of 1968. Wealth, privilege and education have always been liberating for those who had them, and who may have never conformed.

In parallel to the decline in deference, there has been a decline in religious participation. This is not easy to quantify, as information on religious participation is not routinely collected consistently. Church of England participation (measured by numbers on the electoral role, Easter day communicants, Sunday schools or number of clergy) has been on the decline since the 1920s (Halsey, 1988) For example, the number on the electoral roll halved between 1940 and 1985 (Halsey, 1988). Other Protestant churches (various Episcopalians, Presbyterians, Congregationalists, Baptists, Methodists) show a similar pattern (Halsey, 1988). The Catholic Church ostensibly has an increasing membership, but this is belied by decreasing mass attendance, baptisms and marriages (Halsey, 1988). There have been increases in other faiths (Hindu, Moslem) (Halsey, 1988), but this is probably due to immigration rather than conversion of the British born population in this cohort. This may mean that religious behaviour is less a matter of form and more belief. Unfortunately, there are few breakdowns of church attenders, so one cannot say whether it is a middle class pastime or not.

Specifically in health terms, there could have been a decline in personal responsibility for health in the 1950s due to the widespread availability of antibiotics and the introduction of a health service. But this was followed by a very strong promotion of personal responsibility for health from the 1970s onwards, with the

inception of the Health Education Council (HEC) in 1968 (HEC, 1970). 'The notion of the importance of lifestyles and personal responsibility for health was fashionable in the mid-70s' (Macintyre. 1997).

1.4.5 Social structure and social mobility

Given all these changes in society it is not surprising that the nature of work also changed, partly to service expanded social, educational and medical provision. The proportion of occupied persons in manual social classes declined throughout the 20th century. from 75% in 1911, to 70% in 1931, 64% in 1951, 56% in 1971 (Halsey, 1988), 45% in 1991 (Cook, Stevenson, 1995). This change has been accompanied by a significant amount of social mobility (Halsey, 1995). Seminal studies in 1949 (Glass, 1954), 1972 (Goldthorpe, 1980) and the more recent Essex Class project and British Social Justice Survey (Marshall et al, 1997) all lean towards and re-affirm a view of a 'model of constant social fluidity' (Goldthorpe, 1980), best described as 'rising absolute and constant relative rates of mobility' (Halsey, 1995). These are often focused on male intergenerational mobility, e g. Glass's father son pairs, and a limited amount of personal information. A more comprehensive understanding of social mobility requires exploitation of richer data, such as the 1958 birth cohort (Savage, Egerton, 1997), as recently attempted (Saunders, 1995), (Saunders. 1997), or the 1946 cohort.

The impact and significance of these changes is not easy to interpret, because the role of social class in determining behaviour is not obvious. It could be that social class is a norm-imposing attribute, so that upward social mobility itself changes behaviour. It could be that becoming middle class is simply a conventional way of behaving, so the things that predict upward mobility might also predict conventionally 'good' health behaviour. It could be that migration into the 'middle classes' has made it less cohesive and made social class less of a factor in behaviour or norms. However, it is certain that the change in social class structure reflects a reduction in the prevalence of exercise as an integral part of occupation.

1.4.6 Government control

Government interest in smoking, drinking. diet or the public provision of sports facilities tends to place public health in the broader context of public safety, public order, public finance and the interests of industry; hence the introduction of controls on drinking in WW1 to ensure a productive workforce in key industries (Williams, Brake, 1980), or the concern to balance health advice against fiscal and industrial interests (DHSS, 1981), (DHSS, 1984). The banning of smoking on the London Underground resulted from the King's Cross fire rather than concerns over smoker's health; smoking advertising is still permitted.

Despite social and health concerns over smoking and drinking, both alcohol and cigarettes have become relatively cheaper. Between 1952 and 1991 the price of tobacco and alcohol rose more slowly than the overall retail price index (CSO, 1991) whilst real incomes went up by a factor of three. In particular, tax changes have resulted in wine and spirits becoming substantially cheaper by 1984 than they were in the 1960s (Godfrey et al, 1986). Access to alcohol became easier starting in the 1960s. The 1961 Licensing Act allowed shops selling alcohol (off-licences) to be open during normal shop hours with the result that a wider range of retail outlets starting selling alcohol, e g. supermarkets, and currently over 60% of alcohol

is bought from supermarkets (ONS, 1999). The Licensing Acts of 1961, 1976 (Scotland only) and 1988 also enabled longer opening hours for pubs, bars and cafes providing alcohol (Baggott, 1990).

The net result is that cigarettes are as easily obtainable as ever, but there is far less tolerance of where it is acceptable to smoke. On the other hand alcohol has become easier to obtain (particularly for women in the weekly shop from supermarkets) and easier to enjoy in more salubrious surroundings.

1.5 The data source for this thesis – the 1946 cohort

A longitudinal study of a birth cohort provides a unique opportunity to investigate the role of the social or cultural context, because it is anchored in one time and place. By contrast, cross-sectional studies may contain several different generations, which makes it difficult to establish context or the effect of change over time. There are three British birth cohort studies the 1946, the 1958 and the 1970. The National Survey of Health and Development (NSHD) from 1946 cohort has the advantage of being the oldest, containing a very wide range of data, and having data from before and after key public health campaigns.

1.6 Conclusion

It is clear that external events (wars, taxation, and economic depression) can have a striking effect on health behaviour. It is less clear that public health campaigns have much effect; yet promoting healthy behaviour is still seen as a key health policy. A way forward is to develop a comprehensive understanding of health behaviour taking into account external conditions, historic trends and how the individual might choose to respond. The hypothesis is that all of these contribute to patterns of health behaviours (initiation, change, and maintenance). Theories about how these relate to behaviour are discussed in chapter 2. How these theories can be operationalised and tested is discussed in chapter 3. The next four chapters (4-7) tries out the hypothesis on the range of health behaviours already identified, i.e. smoking, drinking, diet and exercise. Finally the last chapter (8) reviews how well the approach worked.

2 LITERATURE REVIEW

2.1 Introduction

Changes in health habits in historical time present two challenges. One is why change over time occurs, and the other is what happens to individuals who live through that time. This critical summary and review of the literature was undertaken in order to seek mechanisms from past research on how health behaviour is affected by the social world, i.e. to get an understanding of how social structure, attitudes, beliefs and self-identity relate to why people start doing something, why they carry on doing it and why they change. This thesis is ultimately aimed at understanding how to improve health behaviour. So, it is not sufficient to provide a good predictive model; it is also necessary to provide potential explanations and causal mechanisms. This is most likely to be the case within a comprehensive and generic framework, which generates testable hypotheses, is parsimonious and is internally consistent. Such a framework however may not comprehensively explain reality.

This summary is concerned with the mechanisms that determine health behaviour. The specific factors, which have been observed to be associated with particular health behaviours in general and in the data used for this thesis, will be discussed in the appropriate chapter.

2.2 Material deprivation and social inequalities

Most current and recent work on health in relation to social context has been concerned with inequality, and the search for explanations why health is better in the non-manual social classes than in the manual. Social inequalities are currently a key public health issue. This originates from the long-standing observation that the poor suffer more ill health (measured by mortality or health status), (Graunt, 1665), (Engels, 1969 [1892]), and that today relative differences remain and have widened since the 1970s (Drever et al, 1996), (Goldblatt, Whitehead, 2000), (Shkolnikov et al, 1998). The mechanisms by which inequalities affect mortality remain to be fully elucidated (Bartley et al, 1998). Nevertheless it is possible that the same relationship holds for health behaviour, i.e. that social deprivation is associated with unhealthy behaviour, and to hypothesise that if mortality and health behaviour follow similar patterns then the same mechanisms apply in both cases.

Relative lack of material resources, of status and power and of social relationships are all thought to play some part in causing people to die earlier Substantial effort has been put into establishing that these relationships exist (Macintyre, 1997), (Popay et al, 1998), comparing the effect of different measures of inequality such as income (Judge et al, 1998) (Lobmayer, Wilkinson, 2000) (Chandola, 2000), (Cooper et al, 1998), education (Shkolnikov et al, 1998) and social position (Marmot, Shipley, 1996) or class (Ostberg, 1997), and demonstrating the long-term effects (van Mheen et al, 1997), (Rahkonen et al, 1997) (Stronks et al, 1998), (Graham, Blackburn, 1998). This close examination has also thrown up some anomalies. There are different reasons for similar levels of perceived ill health in lone mothers in England and Sweden (Whitehead et al, 2000). Increasing spousal income is a health asset for women and a liability for men (McDonough et al, 1999). A socially despised rural area of Japan (Okinawa) has the highest life

expectancy in Japan (Cockerham et al, 2000). Relationships between occupational position and mortality at Nowa Hutta vary over time and are not very marked (Watson, 1998).

It is also thought that relative deprivation causes worse health behaviour (Jarvis, Wardle, 1999), (Lynch et al, 1997). Some health behaviours at some times show the same patterns as deprivation (Jarvis, Wardle, 1999), (Bartley et al, 1999). On the other hand, there are other times, behaviours and places where it is not the case. Women's smoking is an example. In Britain, it is currently associated with deprivation (Graham, 1989). In Spain (Barcelona) in 1992, it was associated with higher social class (Borrell et al, 2000). At other times and places it shows no particular relationship with income, education or social class, e.g. Baltic States in 1997 (Pudule et al, 1999), Finland in 1972 (Vartiainen et al, 1998), or France in the 1990s (Khlat et al, 2000), or China where doctors are increasing their smoking rates (Li et al, 1999).

The mechanism by which inequality causes higher mortality is thought to be concerned with chronic stress, which has a measurable, detrimental physical effect (McEwen, 1998). The causes of this stress have been characterised as 'job-strain' (Karasek, Theorell, 1990) and 'effort-reward imbalance' (Siegrist et al, 1986) with social relationships and coping styles having a protective effect. Effort-reward imbalance can apply in the home just as well as at work. As regards coronary heart disease it is clear that both these factors can have a detrimental effect (Ferrie et al, 1998), (Peter et al, 1998) (Bosma et al, 1998), (Siegrist et al, 1990). As regards health behaviour, it is less clear that these mechanisms apply, in this way. In one study (Ferrie et al, 1998), the stress of organisational change and job insecurity had no impact on health behaviour (Ferrie et al, 1988). Another found that unemployed workers reduced their alcohol consumption (Iversen, Klausen, 1986). Other older studies are difficult to interpret because they are using different constructs and ad-hoc samples (Conway et al, 1981), (Tagliacozzo et al, 1982), (Caplan et al, 1975). In some cases, it appears that stress could be related to smoking, and that social support could be relevant to giving up smoking.

Thus, it appears that the current debate on the effect of inequalities does not completely carry over from mortality to health behaviour, in terms of relationship or mechanism, nor does it deal with the historical context and change over time (Popay, 2000) or the differences between countries. It focuses on the role of social structure, and how it affects people, with less emphasis on personal social engagement (Popay et al, 1998), (McDonough et al, 1999) in influencing behaviour. Consideration of the meaning for those involved might actually explain some of the anomalies mentioned above in the relation between inequalities and mortality. For example how do men feel about wives threatening their role as 'breadwinners', does this make them feel stressed? Faced with stress, coping styles do matter. There is a spectrum of protective factors, which build up over the life course (Brown, Harris, 1989), such as social skills, which may help the individual make healthy choices and need to be considered So, it is useful to consider what other theoretical perspectives are available, and might help provide a more comprehensive explanation taking into account the accumulation of protective and detrimental influences over time.

2.3 Theoretical perspectives

Many disciplines provide insight into aspects of behaviour and the social world. psychology, sociology and anthropology, economics and biology It is best to consider these disciplines not discipline by discipline

but within an overall classification of the type of motivating or causal factor considered, i.e. personal, social (structural and values) and biological. As an overall classification helps to identify gaps and overlaps.

2.3.1 Personal Factors

Traditional health psychology can be characterised in terms of two schools of thought based on internally focused but fundamentally different premises about how individual action comes about. One school has its roots in expectancy-value theory and the other is a spontaneous processing model. All the resulting models are referred to as social cognition models, because they consider health behaviour as the outcome of thoughts and feelings, i e. of a situational decision process.

2.3.1.1 Expectancy value

The expectancy-value approach assumes that 'behaviour and decisions are based upon elaborate, but subjective, cost-benefit analysis of the likely outcomes of differing courses of action' (Connor, Norman, 1995). It is a very similar premise to the much criticised (Sen, 1977) traditional economists view of 'economic man' armed with perfect information accurately weighing up alternatives in a vacuum.

Some models (health belief model, health locus of control, protection motivation theory) are health behaviour specific and some re-use general theories of behaviour (theory of planned behaviour or theory of reasoned action and self-efficacy). All of these models see intentions and/or behaviour as being determined by someone intentionally basing action on a combination of attitudes, perceived susceptibility, perceived severity, benefits, barriers to action, cues to action, health motivation, health locus of control, behavioural control, self-efficacy and norms (Connor, Norman, 1995). There is no generic formulation, nor a comparison of all the elements, nor of all the models (Stroebe, Stroebe, 1995), nor is there unanimity on the concept definitions, e g. the difference between locus of control and self–efficacy (Connor, Armitage, 1998).

The health belief model has been used since the 1950s generally to predict protective behaviours (such as tooth cleaning) and has rather fallen out of favour as it does not seem to offer any advantages over general models of behaviour (Stroebe, Stroebe, 1995) (Rutter et al, 1993). The health locus of control does not seem to add much (Calnan, 1987), even in the eyes of its creator (Wallston, 1991). Ajzen (Ajzen, 1985), (Ajzen, 1991) superseded his theory of reasoned action with the theory of planned behaviour by simply adding in a concept of self-efficacy or perceived control.

A review (Sutton, 1998b) of several meta analysis of the theory of planned behaviour (which says that behaviour is determined by attitudes, subjective norms and perceived control) indicates that it is better at predicting intentions than behaviour, but that it does have some predictive power (Sutton, 1998) 'Nevertheless, even the proponents of such models believe there is room for improvement' (Sutton, 1998), for example by including situational factors, to allow for the possibility that behaviour in one context does not necessarily carry over into another

Protection motivation theory (PMT) (which says that behaviour is determined by perceived susceptibility, perceived severity, benefits and self-efficacy) has often been used to predict intentions rather than behaviour. One meta-analysis, based on 23 studies using some aspect of PMT to predict a health behaviour (ranging from smoking to safe use of pesticides), concludes that PMT is moderately effective (Floyd et al, 2000). It is not clear whether these are concurrent behaviours and so what is cause or effect. Another meta-analysis which specifically considered the prediction of subsequent health behaviour (Milne et al, 2000) found 5 relevant studies and that intention was the best predictor, and concluded 'further research is needed to clearly establish the utility of PMT in predicting behaviour' (Milne et al, 2000).

There are worries about the theoretical consistency and the validity of the psychological mechanisms (Manstead,van der Pligt, 1998), (Sparks, Guthrie, 1998). Perhaps as a result in the 1990s there has been a move towards a new set of concepts and models. Some newer models focus on the process and postulate stages of change, which a person has to go through. However there is controversy over their effectiveness (Lennox et al, 1998), validity (Hilton et al, 1999) and equity (Buxton et al, 1996), (Whitehead, 1997), (Ashworth, 1997). Other new concepts are moral obligations and self-identity (Sparks, Guthrie, 1998). Yet others use habit or past behaviour as a factor which may add predictive power to a model predicting the same health behaviour in the future (Connor, Armitage, 1998) but does not by definition explain change.

There are several issues with these models, which matter because the ultimate aim is not to predict behaviour, but often to change behaviour. If the prediction is good but based on an inaccurate model then effecting change is going to be difficult. They assume thought comes before action despite opposite observations 'As in other domains, people's behaviour seems to be changing in advance of their attitudes' (Sheiham et al, 1987). They also make assumptions about how people think.

Firstly, they assume that knowledge translates into belief, despite long-standing philosophical doubts, expressed in the fourteenth century by William of Ockham (Knowles, 1962). Health educators (Kemm, 1991) have noticed this same problem. At a more practical level (Pill, Stott, 1985) pointed out that. ' Most people appear to be quite capable of holding a number of apparently contradictory general theories of causation at the same time which are brought forward in various combinations depending on the situation and the nature of the question asked.' Even health educators have been found to have knowledge inconsistent with their values (Richard et al, 1998).

Secondly they assume that people are 'quite rational and make systematic use of the information available to them' (Ajzen, Fishbein, 1980), despite evidence to the contrary, for example in something as rational as implementing scientific research (Stacey, 1987). Lastly they assume that people are aware of and can weigh up complicated probabilities. despite evidence to the contrary on both counts (Sutton, 1998b), (Weinstein, 1980), (Jonas, 1993), (Weinstein, Lyon, 1999).

Overall expectancy-value models focus on the individual not the social world, and they give little place to social structures or cultural context (Bunton et al, 1991), (Levy 1991). Norms are part of some models, but there is little appreciation either that the norms for acceptable behaviour may change over time, or why they do so. Their advantage is the acknowledgement of internal motivation, along with the inkling that it

operates in a social world, represented by norms, obligations and self-identity. However, any understanding of how these newer concepts operate is yet to come to fruition.

2.3.1.2 Spontaneous Processing models

The spontaneous processing model starts from the premise that people only make a behavioural decision in a deliberative way when they have the opportunity and motivation to do so. Research in this area has explored when decisions are made in this way, rather than when a more spontaneous method is used, more akin to going along with the first idea that springs to mind (Fazio, 1990). As yet the spontaneous processing model is not well researched, operationalised or much applied to health behaviour (Connor, Armitage, 1998), though it is being actively explored (Fazio, Dunton, 1997), (Millar, Millar, 1996).

However, in concept it is useful for implicitly recognising the importance of norms, situations and the use of simplifying assumptions about one's role as a way of selecting behaviour. It would be more use if it paid attention to why and how some things might be likely to spring to an individual's mind and how that fitted in with concepts such as stereotypes and self-identity.

Overall, despite the considerations discussed above social cognition models do provide some understanding of health behaviour. The models can be moderately effective. The concepts employed in the models, such as locus of control, or self-efficacy, or the underlying skills assumed (for example to be able to evaluate the benefits of changing health behaviour) although somewhat unclear do represent differences between individuals, which have some effect on health behaviour. So, the role of social cognitions is considered as one explanation amongst others for health behaviour, and its use in this thesis is discussed further in the next chapter, under the heading social cognitions. However social cognition models are largely focused on the individual, and the next section discusses behaviour (and health behaviour) in the wider social context.

2.3.2 Social Factors

The role of social structures in determining behaviour, including health behaviour, has been hotly debated since the founding fathers of sociology, Weber, Durkheim and Marx, explicitly formulated the question. Overall, sociologists admit there is no agreed, well operationalised and tested model of the workings of society. 'In sociology, we are still a long way from the sort of grounding of wide ranging causal hypotheses in deep and powerful theories which has been achieved in both physical and biological science' (Runciman, 1998) and 'no one theory or school of theory has so far been able to adequately chart the connections between macro and micro phenomena in a comprehensive manner' (Layder, 1994).

Nevertheless, sociologists have contributed, and in sociology, there are at least two main schools of thought as to how social structures affect behaviour. Some following Marx and Durkheim take a structuralist or functionalist view and see people at the mercy of social forces, with change outside their control, determined by macrosocial entities. Others following a more Weberian line are characterised by 'methodological individualism' and take the view that it is more down to the social actors. Giddens with his theory of 'Structuration' (Giddens, 1984) has done much to reconcile these, using Marx's concept that man makes himself in conditions not of his choosing

2.3.2.1 Social structure

In a structuralist or functionalist approach, external social forces determine behaviour. At an individual level motivation may be unknowable Consumption can be led astray by false consciousness. Popular culture can be imposed on the masses as a means of subjugating them and keeping them in their roles. In some approaches (Marxist or neo- Marxist) the social forces have an economic emphasis. In other approaches there is more emphasis on 'social facts' or social relationships (Durkheim or neo-Durkheim)

Marxism has been influential as a theoretical framework As regards health behaviour economics can constrain the choices that people are able to make. It has been observed in Britain that cost may be a barrier to exercise (Chinn et al, 1999) or a healthy diet (Caraher et al, 1998), (Mooney, 1990), (Cade, Booth, 1990); those on supplementary benefit 'lack the nutritional balance recognised as necessary for long-term health' (Graham, 1984), although the unemployed (Charlton, Murphy, 1997) and the poor eat less fat (DHSS, 1978). At another level economic and social circumstances may constrain the choices available for dealing with life; hence working class women in Britain have higher rates of smoking than other women (Graham, 1984), (Graham, 1989), despite the cost.

The social structure of relationships is conceptualised in many ways: place or neighbourhood, social cohesion and role. Evidence of the effect of neighbourhood on health behaviour is sparse and inconsistent (Duncan et al, 1999), (Ennett et al, 1997), (Hart et al, 1997), (Ross, 2000), (Robert, 1998). The workings of social cohesion are not clearly agreed or understood in terms of definition (Hawe, Shiell, 2000), (Popay, 2000), (Baun, 1999), (Berkman et al, 2000) or operationalisation (Veenstra, 2000). Role for men tends to be in terms of occupation, but for women it is the multiple roles they fulfil (Khlat et al, 2000), and it is not necessarily the case that multiple roles are a problem (Arber, 1991), (Schwarz, 1991). All in all the evidence on social relationships and health behaviour to date is sparse and mixed (Berkman et al, 2000), (Sorensen et al, 1998). Perhaps this is because the things 'which friends share or give to each other are cigarettes, alcoholic drinks, and the proverbial cup of sugar borrowed from neighbours – not to mention AIDS. Hardly a recipe for good health!' (Wilkinson, 1999). The best evidence as regards social cohesion and behaviour is violent crime, which does appear to be linked to lack of social cohesion (Wilkinson et al, 1998), (Kennedy et al, 1998), (Kawachi et al, 1999). This is distinct from the relationships between social cohesion and mortality.

There are three main issues with structuralism or functionalism. Firstly, they tend to downplay human agency, i.e. structuralism or functionalism 'proceed from the same latent anthropology, the same ulterior assumption about Man – that all men and women (except themselves) are bloody silly' (Thompson, 1978). Secondly, they downplay the idea of people making deliberate choices about consumption for some purpose. Thirdly, social structures are often operationalised in terms of easily available but very compressed measures, such as home ownership, which may represent a whole range of underlying concepts such as education, future orientation or status, whose meaning is difficult to disentangle and is unlikely to be directly motivating.

Overall, despite these considerations, social structure is a constraint, which has an effect on health behaviour. The role of social structure in health behaviour has been well explored, often from the

perspective of exploring the detrimental effect of material deprivation and stress and the ameliorating effect of social support on healthy behaviour. The role of social structure is considered as one explanation amongst others for health behaviour, and its use in this thesis is discussed further in the next chapter. However in view of the secular trends observed and the changing nature of society (\$1 2-\$1.4), which have affected health behaviour, the next section discusses the role of agency, how individual engagement in a specific social and temporal context shapes behaviour, i.e. the role of cultural and social trends.

2.3.2.2 Agency

The alternative to structuralism or functionalism is a theory, following Weber, which places more emphasise on what is referred to as agency or social engagement. In this case, people are individually purposeful, aware of the choices they are making within a social context that they understand and reshape on a daily basis, notwithstanding the constraints of structure. In part people are motivated by values, acting on their beliefs and ideas, whose meaning to the individual needs to be understood to understand society, so individual motivation is key. Explicit personal choices about lifestyle and consumption (where possible) determine group membership. Society is grounded in the behaviour of individuals (sometimes referred to as methodological individualism). Individuals can be thought of in terms of 'ideal types', which may make it easier to understanding how individuals, groups or social formations behave (Hughes et al, 1995), (Boudon, 1986), (Bentley, 1999), (Layder, 1994).

At a general level this theory is difficult to deal with. The definition of agency is still a subject of debate (Emirbayer, Mische, 1998), and appears to require redefinition and description whenever it is used (Giddens, 1984). The dynamics of social interaction are not clear, because the social entities are shadowy. How the actions of individuals affect each other in society is difficult to discern, because it is not always clear how individual actions scale up; for example, everyone wanting to live in the countryside has the unintended consequence of turning everything into suburbia. Nor is it valid to make inferences from individual to societal policies (individualistic fallacy). The explanations for motivation vary. Economists with their *homo economicus* have a utilitarian individual calculating what is best for him. Anthropologists on the other hand lean towards the person using goods in a constructive way to create themselves and their society (Thompson et al, 1990) in an image of their choice 'consumption is for other people, not for oneself' (Douglas, Ney, 1998). In this approach consumption is a way of acting out values, creating a way of life (Bourdieu, 1984), (McCraken, 1990).

In a limited sense, this theory is the approach taken by the health psychologists seeing people as individually aware and doing expectancy valency calculations. In another sense it is not because those psychologists are largely missing the social context and the values, the lifestyle choices, which at best is represented by norms. There is some suggestion (albeit unoperationalised) that these ideas are relevant to health behaviour (Cockerham et al, 1993), (Lupton, 1994). But consideration of how that social context works in health behaviour is rare (Backett, Davison, 1995), (Abel, 1991). It is not easy to find evidence of people following a wholly healthy lifestyle (Blaxter, 1990). In a specific sense, it has sometimes been observed that values matter, for example religion being associated with better health behaviour (Pill, Stott, 1985) (Ellison, Levin, 1998).

Apart from the practical problems with this approach, over-emphasis on the individual can easily fall into the trap of blaming a 'culture of poverty' or 'blaming the victim' for 'poor' health behaviour whilst ignoring the practical barriers. On the other hand it does accord with the lay belief that people often do things for a reason, and can shape themselves in an image and are shaped by their aspirations, class, shared memory, and religious beliefs; for example the way women's roles have converged on men's. The advantage of this approach conceptually at least is that it acknowledges the role of human agency, even if how to fill the gap is not obvious. Filling this gap can be most easily considered firstly in terms of the current social context, i.e. interaction with the here and now, and secondly in terms of the temporal context, i.e. the effect of social trends and of living through changing trends.

2.3.2.2.1 Social Context

Sociology provides a wealth of insights. Giddens' structuration theory (Giddens, 1984) emphasises the duality between structure and agency. Giddens is not quite clear on what structure and agency are, he sees structure as rules and resources that have no objective reality, and that are different from the way we normally interpret structure. As a result, 'different authors use varying definitions of the two terms and understand the nature of the ties between them in rather different ways' (Layder, 1994). This makes it hard to operationalise the concept. Nevertheless, it is important in recognising the dynamics and recursive effects of people and structure. People act out established conventions and in so doing reconstitute them

Goffman's writings on the day-to-day dynamics of social interaction (Goffman, 1959) provide insights into the social world. This is where we spend so much of our time dealing with others following learnt but unstated conventions without which day-to-day social life would be an unpredictable and hellish minefield. In so doing, he 'sheds light on how the day to day nature of social life is implicated in the very broad pattern of institutional reproduction' (Giddens, 1987). Giddens interprets Goffman as portraying social interaction as mutually supportive. However others have pointed out, 'seeking the explanation for action in its meaning for others rather than in its causal origins provides the key to Goffman's work' (Burns, 1992).

Giddens' self-identity' (Giddens, 1991) harks back to Weberian lifestyles. This concept is not clearly defined or operationalised in 'Modernity and Self Identity', and it is not clearly distinguished from another concept called lifestyle. "A lifestyle can be defined as a more or less integrated set of practices which an individual embraces, not only because such practices fulfil utilitarian needs, but because they give material form to a particular narrative of self -identity." "overall lifestyle patterns, of course, are less diverse than the plurality of choices available in day-to-day and even longer -term strategic decisions. A lifestyle involves a cluster of habits and orientations, and hence has a certain unity - important to a continuing sense of ontological security - that connects options in a more or less ordered pattern. Someone who is committed to a given lifestyle would necessarily see various options as 'out of character' with it, as would others with whom she was in interaction. Moreover, the selection or creation of lifestyles is influenced by group pressures and the visibility of role models, as well as by socio-economic circumstances." (Giddens, 1991) To summarise Giddens one chooses a vision of oneself from a range of possible options and then acts it out, which makes life a lot simpler and more secure both for oneself and those around one. What is missing from this is a development of the idea to provide a clear definition of what these options might be, a recognition that they might change over time and an explanation of how that takes place.

Cultural theory stems from a literary tradition (Storey, 1993), for example Richard Hoggart at the University of Birmingham, or an anthropological (mainly structural) tradition (Milner, 1994), which tended to ignore the role of agency (Crane, 1994). More recently cultural theory has been colonised by a wide range of theories and frameworks. However sometimes by design these tend to be more abstract than capable of scientific analysis, 'cultural analysis lags behind: indeed in general it seems to be the poor relation of structural analysis' (Archer, 1996). Nevertheless, some cultural anthropologists have postulated that general underlying preferences define consumption and the sort of society people want (Douglas, 1996), (Thompson et al, 1990)

This is undoubtedly an illuminating approach, taking consumption outside the scope of demographic factors, and providing a slightly more concrete explanation for the constructive nature of consumption. It makes the link between personal characteristics, consumption patterns and society. Unfortunately it is not very well tested or operationalised. At a practical level those writing about clothes are very aware of how clothes can be used to construct oneself (Finkelstein, 1991), (Steele, 1988) (Craik, 1994), for example to project oneself as someone with power and authority (in a suit), or as someone ignoring traditional ideals of femininity (in dungarees).

These sociological ideas form a set of suggestions, which could be applied to the understanding of health behaviour as consumption imbued with meaning for others within a framework of established conventions. None of these suggestions have been operationalised or applied to understanding health behaviour before. However, from both a practical and a theoretical perspective it is worth doing; theoretically, because from a sociological perspective both social structure and agency should have a role and practically, because the role of social cognitions and social structure does not completely explain health behaviour. The role of this aspect of agency is considered as a potential explanation amongst others for health behaviour, and its operationalisation and use in this thesis is discussed further in the next chapter.

2.3.2.2.2 Historic Trends

In contrast with engagement with the here and now, there is the time dimension. This is both specifically the individual's trajectory through life, and the broader question of why change over time occurs in individual behaviour, in social norms or habits and in overall consumption patterns. Change over time can be considered from the broad perspective of social theory, the narrower question of how 'social memory' operates, or the even narrower question of fashion, which is concerned with how and why changes in consumption and lifestyle occur. At a general level success to date with social theory can be summed up in one sociologist's cry of frustration: 'why are theories of social change so stubbornly proved wrong by the real world' (Boudon, 1986).

Despite Halberwachs (Halberwachs, 1992) efforts social memory is not well researched 'the study of human memory as a social process in its own right has still to receive the full attention of psychological research' (Middleton, Edwards, 1990) 'There is a striking disparity between the persuasiveness of social memory in the conduct of everyday life and the relatively scant attention, at least as regards explicit and systematic as distinct from implicit and scattered treatment, that has been paid specifically to social

memory in modern social and cultural theory' (Connerton, 1989). As a result, it is hard to find anything beyond discursive studies. For example Connerton suggests commemorative rituals (such as religious and national ceremonies) are an important part of social memory maintained through bodily practise, but this does not adequately explain how such ceremonies persist, why they change or how that insight translates into other types of social memory. In health at a general level, it is clear that remembered considerations of health might form social habits. For example the prescribed care of babies and young children in the 1950s with its emphasis on fresh air, not getting over tired or over stimulated and having regular habits has echoes of the TB sanatorium, as if that sort of 'curative' regime would protect them from the by then far less threatening risk of TB. Specifically also there is some evidence of children copying their parents health behaviour (Murray et al, 1985), (Green et al, 1991), (Chassin et al, 1998) (Rossow, Rise, 1994), (Vilhjalmsson, Thorindsson, 1998), though evidence of more general transmission of health beliefs is mixed (Blaxter, Paterson, 1982), (Wickrama et al, 1999). However, to what extent it is due to genetics and moderated by the social context, i.e. peers, is an active topic of debate (Harris, 2000), (Vandell, 2000)

Generally, the recognition that the industrial revolution must have been accompanied by a consumption revolution is fairly recent (McCracken, 1988) (McKendrick et al, 1984) (Friedman, 1994). This is partly because consumption has been seen as a hollow substitute for an identity concerned with the means of production. As a result the way consumption works and touches all aspects of our lives has not been fully researched or understood, and very rarely considered in health behaviour. One small study of young people in Ireland observed that fashion conscious women were more likely to smoke, and fashion conscious men less likely, (O'Connor et al, 1997), but did not explain what motivated people to be fashion conscious. 'Why the view of what is fashionable changes, and what drives the individual acceptance or rejection of what is fashionable, are important questions which are only now beginning to be studied' (Wadsworth, 1999).

Change over time in consumption habits is often caricatured as frivolous. To quote Rogers (1983) 'Gabriel Tarde observed that status seeking was a main reason for imitating the innovation behaviour of others. For certain innovations, new clothing fashions for example, the social prestige that the innovation conveys from its adoption is almost the sole benefit that the adopter receives.. many clothing fashions are fads. A fad is an innovation that represents a relatively unimportant aspect of culture, which diffuses very rapidly, mainly for status reasons, and then is rapidly discontinued... many lower income individuals do not care about clothing fashions'. 'Matters of taste are, nevertheless, considered to be inconsequential because they have few or no connections with other beliefs. If changed, they have few or no implications or consequences for maintaining other beliefs involving self-identity and self-esteem .' (Rokeach, 1968). This is to confuse the meaning of a particular fashion, which may be pure frippery, and the meaning of choosing or not choosing to follow fashion, which is rather different, and is as such making a clear statement about who one is and how one sees one's position in society.

We know that fashion affects everything we do from the food we eat (Montanari, 1994). (Nelson, 1993) to the way we think (Kuhn, 1970). 'One cannot understand the modern consumer society and the meaning of consumption in a modern society if the social mechanism of fashion, a self dynamic social process is not properly understood and analysed.' (Gronow, 1997). Theories of what drives changes in fashions, and as a

result changes in social habits and norms currently revolve around two long-standing approaches (Ragone, 1996), a diffusion model (Katz et al, 1963) (Rogers, 1983) and a trickle down model (Simmel, 1957 [1904]).

Diffusion models have a long history in rural sociology. Diffusion models are used to explain the pattern of uptake of new ideas and behaviours. In the most common model (Rogers, 1983) people are divided into five key categories - innovators, early adopters, early majority, late majority, late adopters - based on their individual characteristics, such as how quickly they picked up the last new idea, position in the community, resources, and social contacts. This approach is well accepted in the marketing world (Foxall et al, 1998). It may well be a good predictor of change but the level of insight into why people changed (because they changed last time) is rather low. It is also likely to focus on those who are most likely to change, rather than on those who most need to change, so there are also issues of equity. Roger's diffusion model has been suggested as an explanation for the changing trends in smoking (Waldron, 1991), (Graham, 1996).

The traditional paradigm, developed from the ideas of Simmel (1957 [1904)] and Veblen (1994 [1899]) and used in some senses by Bourdieu (1984) sees fashion as driven by the twin forces of a gaining and preserving status. Those with lesser status copy the behaviour and consumption patterns of those with higher status in the hope that status will 'rub off' from the acquisition of goods. Those who are being copied move onto something new in order to differentiate themselves and thus preserve their original status.

This approach has not often been tried out explicitly in health behaviour research, though there is a recognition of the importance of status, and possibly our blindness to our use of consumption; to quote Wilkinson, "if we are to move towards environmentally sustainable levels of consumption, it may be necessary to reduce the status differences, which drive the competitive element in consumption But, as Schoer, says, 'We live with high levels of psychological denial about the connection between our buying habits and the social statements they make" (Wilkinson, 1999). Sometimes a socio-hierarchical model of social change is used for health behaviour, often without the status rationale (Lindblach et al, 1997), (Borrell et al, 2000). It is subscribed to more explicitly by those studying fashion (Flugel, 1940), (Bell, 1976). However there are some fashions, which emanate from what could be regarded as low status groups, for example the erstwhile popularity of rap clothing and music, the Beatles or 'counter-culture'. This is not actually a counter-example, as it is not a question of saying how a particular item might be selected as the latest fashion, but how that new fashion should spread. One can easily guess at some of the desirable attributes of a new fashion, such as exclusivity, unattainability (e g eternal youth) or expensive in time or money.

'Trickle down' has the benefit of crediting the consumer with consuming with a coherent purpose, explaining why and how change over time occurs, and predicting how change should occur. Status is an intuitively appealing motivating force for change. Occupational status matters to people, and was until 1980 formalised within the Registrar General's definition of social class. We do appear to be surrounded by manifestations of status in our daily lives (size of office, age and beauty of secretary, freedom to be

capricious). On the other hand, status is a one-dimensional concept. It is simply a gradient, and does not capture the fine grain of what social attributes really are important to people and why, so in that sense it is complementary to the other aspects of agency discussed previously. Given the secular trends in health behaviour (§1.2) an explanation for change over time is needed, so status-seeking as a driver for changing social trends is considered as another possible aspect of agency. Operationalisation and use in this thesis is discussed further in the next chapter, under the heading 'Agency'.

2.3.3 Biology

The biological approach sees people more at the mercy of their bodies. This can happen in two main ways It may be evolutionary determinism with people concerned with their own survival and the survival of their genes, or it may be some biological feedback mechanism following from the possibly deleterious effects of lack of status, power, wealth, or social relationships (discussed earlier), which makes people strive for them.

Undoubtedly there is a genetic basis for some aspects of social behaviour. There is evidence for genes shaping (alongside environmental effects) health behaviour (Kendler et al, 2000), (Swan, 1999), (Koopmans, Boomsma, 1996), (Viken et al, 1999), (Beunen, Thomis, 1999) However there is also some evidence that the expression of these genetic influences depends on the social context (Kendler et al, 2000). Given the large-scale changes in health behaviour that have taken place in 20th Britain (§1.2), in what one assumes to be a relatively stable gene pool, it suggests that the reasons for change lie elsewhere. Additionally if behaviour is found to be genetic, how do you use the information? Do you predict someone's behaviour from their DNA, and having done so what is the mechanism for changing behaviour: do you change their DNA? Alternatively do you find some more general characteristic, which may be associated with certain genes, such as maleness, and use this to explain how society works. Once you have done that you are straight back into aggregation effects, and having to explain why being male may have different effects in different cultures. For example, it may entail a greater propensity to violence and dominance, but why is that more or less so at different times and in different cultures than others. If maleness were a factor, the key point would be how to moderate its effects in a social context.

At this stage, understanding biological effects concerning social behaviour is still in its infancy. The best it can offer is some pointers as to what might be worthy of consideration. There are suggestions from animal research that social items such as status could have a positive effect on the body (Wilkinson, 1999), and if that is the case, it would be even more understandable if people were to strive for it. Coming at it more from the angle of what confers emotional resilience, it appears to be positive life experiences (Brown, Harris, 1990), thus underlining the importance of understanding the life course. Biological explanations for health behaviour have not been considered further, as appropriate biological data is not readily available.

2.4 Conclusion

This review indicates that there is no complete, coherent analytical framework for understanding the dynamics between the social world and individual health behaviours. The inequalities debate in epidemiology provides at best a partial answer, and thus indicates a wider perspective could be useful. Hence, the review from first principles of all possible approaches given here.

Psychologists have studied the field since the 1950s. Their social cognition models are operationalised and tested, albeit with different representations of what makes people take action. By definition, the focus is on the individual. They provide some operationalised concepts for abstract individual motivation, but leave gaps as to exactly what leads people to take action and how that is influenced by the dynamics of social interaction. Social theories have the potential to fill the gap on social interaction, i e. to explain the effect of social structures and of agency Research to date has focused mainly on the role of social structure. This leaves a gap as regards the role of the person and how change over time occurs, which has not been much operationalised or tested in relation to health behaviour; hence, the discussion in this chapter of potentially illuminating theories and ideas about how these operate. Biology or genetics provide another possible explanation for behaviour, but the mechanisms are not yet clear so it is not discussed further.

This thesis within the limits of the data available will consider three major explanations; these are social cognitions (derived from the health psychology theories (§2.3.1)), social structure (derived from the health inequalities studies (§2.3.2.1)) and agency (role of the person in social engagement with the social and temporal context (§2.3.2 2)), and their relevance to understanding health behaviour. The next chapter describes how these explanations have been operationalised and tested in this thesis

3 METHOD

3.1 Introduction

The first chapter explained the relevance of placing health behaviour in a social context. The second chapter identified broad categories related to health behaviour, i e. social cognitions, social structure, and agency (covering the here and now and historical trends). This chapter develops these categories and discusses their operationalisation and measurement within the limitations of the data on the NSHD. It then goes on to explain the hypothesis and how the analysis will be carried out. Agency is discussed in more detail first because it is least often explicitly operationalised

3.2 Operationalisation of Agency

Social class has traditionally been used as a measure of lifestyle or culture, for example (Blaxter, 1990), (Cooper et al, 1998), where lifestyle denotes a set of attitudes, values and possibly group norms. Social class is readily available. It is a potential measure in several contexts, so it is useful to consider it before a more detailed discussion of the operationalisation of agency.

In the UK, the Registrar General's social classification (RG social class) is a long-standing measure. It was originally devised empirically in 1921 to reflect the increase in mortality rates with declining social class (Brewer, 1986). It quickly became a measure of 'general standing within the community' or 'social standing' as in the 1971 census (Brewer, 1986), but in 1981, it was described as a measure of skill (Prandy, 1999). It has several possible meanings: social standing and hence status, relation to the means of production, skill or even lifestyle. It means different things for men and women, such that their spouse's social class better predicts women's mortality than their own (Bartley, 1999).

In recognition of the difficulty of understanding what social class represents, two more theoretically based measures of social class have been developed, referred to as the Erikson-Goldthorpe class schema and the Cambridge scale. The Erikson-Goldthorpe class schema is a theoretically based measure of employment relations and conditions, as such, it is a clearer measure of social structure (Chandola, 2000). It forms the basis of the new UK National Statistics Socio-Economic Classification It does not show quite the usual gradient in mortality (Chandola, 2000). The Cambridge scale for social class places people according to their level of interaction. As such, it is a measure of general social advantage and lifestyle (Prandy, 1999), and has been successfully related to some health behaviours (Bartley et al, 1999).

One possible way of operationalising agency would be to use social class The Cambridge scale would be more appropriate, as it is more lifestyle orientated However, social class gives a one-dimensional explanation for action It does not enable one to get behind the concept of social class and understand why a person chooses one lifestyle over another, nor does it by itself explain why change over time occurs. Education is another possible measure; however, education is an enabler, broadening the choices available, and it does not explain the choices someone makes. Instead, Giddens concept of self-identity has been used as the basis for a broader, deeper operationalisation of the here and now aspect of agency, using the

concept of image, while the role of social trends has been considered to explain change over time. These operationalisations are described in more detail below.

3.2.1 Image

Giddens concept of self-identity (§2.3.2 2 1) encapsulates the idea of there being a coherent, meaningful set of choices, which determine how one lives one's life and which is chosen from a limited set: "we have no choice but to choose" (Giddens, 1991). Potentially self-identity can also include the other ideas noted in the preceding chapter, i.e. that the explanation for action lies in its meaning for others, and that consumption is a way of acting out values. These ideas are developed below into a concrete, testable way of understanding the role of agency in choosing behaviour.

3.2.1.1 Image definition

Image is convenient shorthand that sums up how something appears, be it a person or an activity. Outwardly, it can be a way of categorising people or activities. Inwardly it can serve as a simplifying reference point. Is this activity consistent with my image of myself? If so I'll do it, if not, I will not. As such, image encompasses both the 'zeitgeist', (i.e. the ideas and norms prevalent in society) and how an individual might choose to respond. It can have a powerful effect on behaviour. For example my father devoted much of his life to projecting himself as a 'gentleman' in contrast to my father-in-law as an 'academic'. The 'gentleman' image encompasses dress, attitude to authority, attitude to women, attitude to money and ways of handling feelings, which is manifest in the way he presents himself or herself to the world and leads their life. To sum it up, activities have a public image, while people have a private image. The closer public and private image match the more likely the person is to do the activity. As such, public image is a way of representing the social context.

Image is not a new idea. In lay explanations, it has been around for some time. 'All the world's a stage, And all the men and women merely players; They have their exits and their entrances: And one man in his time plays many parts' (Shakespeare, 1951 [1590s]). It has been explored from the point of view of understanding perceptions of others and self in psychology, there is the examination of stereotyping (Leyens et al, 1994), and of the role of the narratives or myths we construct about ourselves to make sense of our own lives (McAdams, 1993). The idea of image as determining behaviour has been considered by sociologists (Boulding, 1956), but there is little evidence of it being operationalised and tested.

3.2.1.2 Image Dimensions

A way of operationalising image is as a set of preferences about some underlying aspects of culture and values. These should matter to individuals, be something they can project through how they live their lives, and which others can interpret because they refer to a commonly understood set that refer to both a person and an activity. Image can be thought of as persona, which someone chooses to project from a limited range of recognisable images available. To be able to operationalise image one needs to define the dimensions that make up such a set, dimensions that people might see as important and associate with themselves and with an activity. Another way of thinking of these dimensions is as an underlying structure to people's preferences. Disciplines, which might provide answers as to what these dimensions might be, are cultural theory and psychology.

One definition of culture is: 'Culture, then, is the realm of meaning, of values and symbols, located in specific structural contexts' (Swingewood, 1998). However, culture studies did not provide much guidance on operationalisation. "For purposes of description there is a glaring lack of descriptive 'cultural units', and for the purpose of explanation culture swings wildly from the supremely independent variable in some theories to become the passive dependant variable in others" (Archer, 1996). In general, cultural theory is not a good source for a set of value related dimensions. There are two possible avenues: deduce from the topics in cultural theory or follow one group who have tried to analyse how general underlying preferences define consumption and the sort of society people want (Douglas, 1996), (Douglas, 1986).

Examples of generic topics in cultural studies are individualism v collectivism (Crane, 1994) and gender (Chaney, 1994). Mary Douglas postulated that the type of society people want determines their use of goods (Douglas, 1996), (Thompson et al, 1990). Douglas and her followers categorise people on two dimensions, group allegiance and structure allegiance (Dake, 1991) (Thompson et al, 1990). There is a common set of underlying values, which determine how each person sees their allegiance. These values are respect for authority, importance of social relations and spirituality. The weakness of this approach is that it is not well accepted or complete, but at least it is an attempt, which provides some possible dimensions.

In the psychological field, seminal work was done by Hofstede (1980) in the 1970s who defined value as ' a broad tendency to prefer certain states of affairs over others' and who identified four still used universal work-related value dimensions (Fernandez et al, 1997), (Bochner, 1994). These are power-distance, uncertainty avoidance, individualism/collectivism and masculinity/femininity. The components of individualism/collectivism are still a matter of debate. They could be tradition, conformity, sociability (Schwartz, 1990) or obedience, adherence to group norms (Triandis et al, 1993), or some aspect of family, peers or society (Realo, Allik, 1999). There is also evidence that individualism/collectivism can be seen as two dimensions, individualism versus authoritarianism and collectivism versus withdrawal from groups (Gelfand et al, 1996).

The weakness of Hofstede's (1980) work is that by focusing on IBM working conditions he was mainly considering middle-class men, and he was focused on work related values. So, he did not consider a key part of our society, which entails values, i.e. religion, though he did acknowledge it has a role (Hofstede, 1980). It was not relevant within the context of his study. Nevertheless, religion is an important part of many people's lives, and has been so throughout history.

Taking advantage of the similarities between the cultural theorists' and psychologists' concepts, it is possible to construct a simple set of dimensions. These are conformity (the authoritarian part of Hofestede's individualism/collectivism and Douglas's structure), sociability (akin to the collectivist part of Hofestede's individualism/collectivism and Douglas's group), gender-identity (Hofstede's masculinity/femininity) and religiosity (possibly Hofstede's long-term orientation and Douglas's spiritualism). The concepts are discussed in more detail below, before going on to explain how they are measured.

3 2.1.2.1 Conformity

Conformity as opposed to rebelliousness for an individual is about being willing to follow rules and regulations. For an activity, it is the generally accepted norm. Individual rebelliousness has been observed as a factor related to smoking in different cultures, for example US and Finland (Lipkus et al, 1994), (Hamynen et al, 1987). Rebelliousness is not the same as the hostility construct, which has sometimes been linked to smoking and drinking (Whiteman et al, 1997), (Lipkus et al, 1994). Hostility is an attribute of a person, but it is not an attribute of an activity, and it is difficult to define.

3 2.1.2.2 Sociability

Sociability is about how the individual feels about social relations, how they want to project themselves, or come across. As regards an activity, it is whether it is perceived as a social activity or not. As others have pointed out social skills are different from social support (Stansfield, 1999). Sociability is about what the person chooses to do for himself or herself (i e. agency), while social support is about what is available to the person (i.e. structure). This aspect of social life has not been much considered in health behaviour. The closest is considerations of personality, with extraversion associated with smoking (Lipkus et al, 1994), (Cherry, Kiernan, 1976). However that is slightly different again, because it is more about how the person is, not how they choose to be.

3.2.1.2.3 Gender-identity

Gender-identity is not a question of biological sex. Gender-identity is where one is on the continuum between masculinity and femininity. For an activity, it is whether it is seen as masculine or feminine. Gender-identity has been considered before using the idea that unhealthy behaviour is related to some gender-identity strain (Ricciardelli et al, 1998), (Parker, 1969), (Beckman, 1978). That is not quite the same interpretation. It is interpreting a gender-identity of women being too masculine or men too feminine as a problem, rather than making the link with the social context, i.e. drinking has masculine connotations and those (of either sex) who see themselves as more masculine might be more inclined to drink. Recently there has been a recognition that gender matters (Dean, 1989), (Bird, Peiker, 1999), and so has the idea that the social construction of gender might affect health behaviour (Courtenay, 2000).

3.2.1.2.4 Religiosity

Religiosity is about having and living out religious values. For an activity, it is a question of its moral interpretations. A recent review suggested that religiosity is related to better health outcomes and better health behaviour (Ellison, Levin, 1998). This could be the direct benefits of religiously inspired activities such as philanthropy or prayer (Krause et al, 1999), (Francis, Gibbs, 1996), or for broader reasons concerning the role of religiosity in someone's life. However, religiosity is not simply social support Being part of a religious organisation may increase access to those who might help, but equally may involve social obligations. Religiosity is not the same as the out-moded concept of fatalism, which has sometimes been used to 'explain' health behaviour (Davison et al, 1992). Again, fatalism is about how the person is, not how they choose to be.

3.2.1.3 The value of the concept of image

Before discussing the pros and cons of image, it is important to clarify the concept, and distinguish it from

other concepts, such as norms, status or lifestyle. Norms are a set of commonly accepted rules that the individual has the choice of conforming to or not conforming to. Norms correspond to only one dimension of image (conformity/rebellion). Status is a one dimensional ranking in a hierarchy, whilst image offers several dimensions. Lifestyle as discussed earlier (§2 3.2.2) is an imprecise concept.

The strength of the image concept is that it is a generic application of Giddens concept of self-identity. It is dynamic, encapsulating action and re-action. It is multi-dimensional. It gives people the freedom to choose. It encompasses values and meaning at an individual level. It assumes that the individual is doing something for a reason, and does not involve the assumption that unhealthy behaviour is the result of some individual failing, e.g. low self-esteem, lack of social skills, fatalism or whatever. It links back to accounts of self-concept that occur in qualitative studies of health behaviour (May, 1999). It provides a role for social context. It provides a way of explaining the effect of culture without having to assume that social class is a cultural attribute with a lifestyle. Finally, a specific understanding of image may provide insight into how to make changes. For example smoking has always had an image of being grown-up and sophisticated, and hence appealing to adolescents, who may or may not see the information that they could die of lung cancer 40 years hence as very relevant. If the image could be moved on to elderly women in hairnets, flowery print dresses and carpet slippers smoking might be less appealing.

A weakness of the image concept is that it is a time and place specific. To understand behaviour one needs to understand the specific cultural context and cannot generalise directly from one time and place to another. However, the underlying mechanism is the same (consistency between public and private image), even though it may result in different behaviours in different cultures, because of differences in the public image.

The benefits of operationalising image in terms of dimensions such as conformity, sociability, gender-identity and religiosity are these. It is a theoretically based approach, which avoids the potential issue of constructing dimensions from the data and then finding them difficult to interpret. Conformity, gender-identity and religiosity relate to some of the social context issues for this cohort described in chapter 1. They are a manageable number of concepts, which appear to be distinct. Activities can be classified on these dimensions. Some of them have been used before in studies of health behaviour, though often in isolation from each other or of the social context of the activity concerned. The weaknesses are that these might not be all possible dimensions. However, if the missing ones are independent of the ones defined so far, then it will not affect these ones, but could overall under-state the effect of image If the missing dimensions are not orthogonal then they are unlikely to be that important; at best, they would be a re-interpretation of the existing dimensions. Ideally, it would be desirable to explore and define all possible dimensions, but meanwhile it is more useful to try something out in potentially an incomplete way than to spend forever creating the perfect theory.

3.2.2 Social trends

The first chapter showed how health behaviours appeared to be subject to historical trends. Ideally, one would like to have a straightforward way of describing social trends at a population level and of identifying at an individual level who might be influenced by them and when This is often characterised

as fashion. The second chapter discussed available theories of social change and some operationalisations (diffusion and status-seeking), neither of which are yet well established in health behaviour. Nonetheless, the fashion for smoking (and for not smoking) has been successfully shown to have started in the higher socio-economic status (SES) groups and then spread to lower SES groups (Graham, 1996), (Cavaleers et al, 2000). It also seems to be the case that although these trends show the same pattern for men and women, trends for women have taken place years later than trends for men.

Given it is not clearly established how fashions spread, for the purposes of this thesis it is hypothesised following Simmel that fashions are spread by status seeking. There are several reasons for this choice. It is better to have an explicit hypothesis, even to disprove it. This explanation fits as a representation of agency, where there is individual motivation and choice. The time delay for women accords with the lay perception that women have a lower status than men. So to sum it up; activities have a status value and one reason people do an activity is to acquire status, as more people do the activity the status value declines, its popularity wanes, and social change occurs. Those with more status would be expected to follow a new trend sooner.

3.3 Data on the NSHD

The NSHD is a class stratified sample of 5362 births in Great Britain from one week in March 1946. The NSHD was originally conceived as a study of the provision and use of maternity services at a time of concern over the falling birth rate (Wadsworth, 1991). It became a study of the impact of the environment and social change on health, growth and all aspects of development, and has remained so with regular data collections in adulthood, the most recent in 1999. It was funded by a variety of bodies in the 1950s, and relied largely on the goodwill of schools and health visitors for its data collection. It has been supported by the Medical Research Council since 1962, and usually been attached to various public health orientated university departments; however, it spent 1962-1979 as a unit in the department of demography at the London School of Economics.

Inevitably, the NSHD is a product of its time, its funding and the institutions in which it was housed. Health in the 1950s tended to be measured in terms of visible physical development, and behavioural development. With the contemporary expansion of education and the interest in social mobility at LSE (Glass, 1954), the emphasis was placed on education and what facilitated social mobility (Douglas, 1964). This means there is wide-ranging data on childhood and adolescent behaviours, from a range of sources including teachers. Throughout there is a lot of information on social structure. On the other hand, during the time at LSE there was less emphasis on collecting health related information, which only really started up again in 1982. In addition, in adulthood, it is harder to find objective sources of behavioural measures, and more emphasis has to be placed on self-assessment of how people feel.

3.4 Measures and measure definition

In the context of the NSHD, there is a large but not necessarily all-encompassing or distinct range of measures, which can be used to represent the different reasons for action encapsulated in the categories identified in chapter 2, i.e social cognitions, social structure and agency (covering image and social trends). In some cases, there are measures that could fall into more than one category. In these cases, the

measure is put into only one category, in order to keep the categories distinct and the reasons given. That this happens is simply a limitation of re-using existing data. This section gives the broad outline of what measures have been used from the NSHD data, why they were chosen, and any potential issues with them.

For agency, (i.e. image and social trends) it is also necessary to delineate the society wide side of agency, i.e. the public image and population level trends. This section also explains how these society wide concepts have been captured.

3.4.1 Social Cognitions

Social cognitions have been widely investigated using questionnaires on attitudes, beliefs, fears and feelings aimed at determining how these measures relate to intentions and actions. However, the NSHD was not asked about health attitudes, beliefs and intentions. So social cognitions can only be measured indirectly.

The previous discussion of social cognitions (§2.3.1) identified the importance of thinking skills either to carry out a complex cost benefit analysis (expectancy value) or to be willing to make a decision based on thought (spontaneous processing models). This suggests that those most used to thinking, from length or level of education, from their partner's influence or from their parents' interest in their education, might be most likely to follow advice These measures are all available.

Other ways of interpreting education also need to be ruled out. It could be that education is a surrogate for cognitive potential, for social class acting as a norm imposing attribute, for income or for some other unobserved factor that correlates with health behaviour and education (such as competence). The wealth of detail available for the NSHD means that cognitive potential, social class and income are all available. They can all be considered in any analysis in order to establish if they have independent effects on health behaviours, or whether they appear to be alternative measures of the same thing, such that substituting one for another makes no difference. Checking if health behaviour and education exhibit the same relationship across a range of behaviours will help determine if there is an unobserved factor correlating with both education and health behaviour.

The disadvantages of operationalising social cognitions as education is that one is missing a great deal of the depth and detail, and as a result may well underplay the role of social cognitions. Hence, it is not going to be possible to say they are ruled out, only give some attenuated indication of whether they could be relevant. It also leaves open the interpretation of why education matters.

For the use of social cognition models to be valid, it does require that people are aware of the relevant health message, and understand how to put it into action. For example if the message is reduce your fat intake from 40% of total energy to 34% then you can only postulate that intentions, attitudes and beliefs motivate action if you can show that people understand what that instruction means in everyday life. So it is also necessary to establish for each health behaviour what the contemporary health education message was and how well known it was. If behaviour changes precede the message it suggests other factors are also at work.

Because all the measures for social cognitions relate to education, in the interests of intelligibility, this category is referred to throughout the rest of this thesis as 'Education'. The precise measures used to represent education and their definitions are given in Appendix A, section $A. 2.1

3.4.2 Social Structure

As discussed previously ($2 3 2 1) social structure is usually considered in terms of economics and social relationships. Each is now considered. In particular, social relationships may moderate the potentially 'bad' consequences of stress. In the interests of not sounding too formal the social structure category is referred to as Social Circumstances throughout the rest of this thesis.

3.4.2.1 Economic

Material conditions are a key economic variable. In many studies, income is not available. In some cases car ownership or housing tenure are used as proxies for income. In other cases education, income and social position are treated as inter-changeable measures of socio-economic status

Income, education and social class potentially represent different concepts. Income is by definition an economic measure. Education provides skills and broadens opportunities. It is generally taken to represent 'culture' (Bartley et al, 1999), so as such it has not been used as a measure of social structure. RG social class is hard to interpret ($3.2). The Erikson-Goldthorpe class schema. which is a representation of social structure, is not available. Given these problems, and the availability of other measures, such as income, RG social class has not been used as a measure of social structure. In practise, income is distinct from education or social position (Geyser, Peter, 2000), and education and social class are distinct, at least as regards their effect on smoking (Davey-Smith et al, 1998).

For the NSHD there is information in adulthood on income and whether the NSHD member felt it was adequate, and information on housing tenure in both childhood and adulthood. Car ownership is not considered because these other measures are available. Housing tenure is used in childhood as a proxy for income, and is considered in adulthood for consistency, and because many other studies do. There is also some evidence that in relation to mortality, housing tenure has an effect independent of income (Macintyre et al, 1998), so it might underplay the role of economics in health behaviour if it was not considered. On the other hand, tenure is a measure of more than income. It represents a choice in how to spend money and may show the propensity for long-term thinking. Acquiring one's own home may represent a significant achievement in life, the acquisition of security and a choice about where to live So, although in this research tenure is treated as representing structure, in reality its meaning may stray from structure to agency.

As these are mainly measures of Material Circumstances, they are referred to as such throughout the rest of this thesis. The precise measures used to represent Material Circumstances and their definitions are given in Appendix A, section $A.2 2

3.4.2.2 Social Relationships

There are several aspects to social relationships role, family, social support, and neighbourhood Role can be as workers, parents and/or carers. Family is a question of who makes up the family unit. Social support is the availability of a supportive network of friends. Neighbourhood is about whether someone lives in a cohesive area

In the NSHD, there is childhood information on family (e g. parental divorce, parental ill-health) and social support (activities and interests with peers and parents). In adulthood, there is information on role (employment status), family (children in the household, marital status) and social support (e g. membership of clubs or associations).

Theoretically, it would be possible to make some classifications about the quality of the neighbourhood the NSHD member grew up in and lived in during the 1980s, using proxies for social cohesion, such as crime levels, levels of inequality and suchlike. However, this would require an understanding of how locations have changed over time, but without better evidence that it matters it has not been attempted. Social support is the indicator used in this thesis.

The advantage of some of these measures, such as parental divorce, marital status, employment and presence of children, is that they are well known, and have often been used before in other studies. The disadvantage of these measures is that they do not capture each concept to the same extent or the same level of precision. So one can only get an approximate idea of their effect, and one may seem better than another simply because it is a better measure of the underlying concept, not because it is in itself more important. This argues for viewing the effects of these measures in terms of what they represent, not literally. It is not always the case that they cover the 'correct' concept, and other possible interpretations of the measure need to be explained and considered when reporting any results. A better understanding of exactly what they mean to people would make them easier to use and interpret.

As these are mainly measures of Social Support, they are referred to as such throughout the rest of this thesis. The precise measures used to represent Social Support and their definitions are given in Appendix A, section $A.2.2

3.4.2.3 Stress

Stress is a term in common use and subjectively we are probably all aware of how it feels in contrast to emotional well-being; however, both of these are hard to define or measure (Pollock, 1988). In the literature stress is considered in many ways, for example as job strain, daily hassles, feelings of anxiety, life events. Doubtless it would be possible to construct a measure of stress from the NSHD data, and validate it by repeated testing against a gold standard for stress. Investigating the role of stress is not the focus of this thesis. However in recognition of the role stress could play in explaining health behaviour it has been included by using well-validated measures of depression previously used successfully for the NSHD in childhood and adulthood (van Os, Jones, 1999), in preference to using a possibly questionable semi-validated stress scale The precise measures used to represent Stress and their definitions are given in Appendix A, section $A.2 2

3.4.3 Agency

Agency covers social engagement, which has been sub-divided into a representation of engagement with the here and now, i.e. the role of image, and a representation of the engagement with historic forces, i e. change over time or social trends. By definition as these are trying to capture social engagement, i e. action and re-action in the social world, these have both a private and a public aspect, both of which need to be captured for the NSHD. As the agency category represents two distinct ideas. image and social trends, these are henceforth treated as two separate categories of explanation, and discussed separately below.

3.4.3.1 Image

3.4.3.1.1 Private Image

This section covers the selection and validation of individual level measures to represent each dimension of image. The beauty of the NSHD is that at an individual level there are measures, which simplistically could be construed as relating to dimensions of image, i.e. conformity, sociability, gender-identity and religiosity. These are not perfect measures. In some cases, it is possible to find both childhood and adulthood measures of image dimensions. In other cases, only childhood measures are available. So one has to assume that there is some continuity from adolescence, just as this broad assumption is made about personality, starting with Freud, and found to have some validity (Finn, 1986), (von Dras. Siegler, 1997), (Caspi et al, 1997), (Gest, 1997), (Shiner, 2000). Collecting new data on these topics would be very useful.

The problem with the NSHD is how to choose the best and most relevant measures, and how to be sure they are measuring the right dimension. Selecting potential measures cannot be anything other than subjective, and is constrained by the data already collected. These selections should not be taken as recommendations on how to measure these concepts but one way of doing it given the data available.

The initial approach was to look for all potential measures that might represent the dimension of interest, based on an historical appreciation of what those activities meant at that specific place and time. For example in the 1950s in Britain going to Sunday school could be construed as being related to religious affiliation and religiosity, or being difficult at school could be construed as rebellion. On the other hand, in different cultures at different times going to Sunday school could be construed as an act of rebellion This approach focuses on actions rather than on attitudes and beliefs. The advantage is that one does not have to worry about how attitudes and beliefs translate into action in a social and historical context, or the validity of paper and pencil tests The disadvantage is that one has to make a subjective interpretation of the meaning of some actions, and rely on assessments by others, mainly teachers. However, teachers' assessments were found valuable for the 1958 cohort (Power et al. 1991).

Selection was made from that initial set of measures based on meeting as many as possible of the following criteria.

- Provide some measure of the concept in childhood, adolescence and adulthood
- Be relevant to the underlying concept, e.g. attendance at religious services for religiosity
- Divide the NSHD into reasonably sized groups, to ensure power and robustness in the analysis

- Display some internal consistency with other plausible measures of the same concept. A well-established way of assessing internal consistency is to use Cronbach's alpha (Cronbach, 1951), which is based on how well the items correlate Cronbach's alpha ranges from 0 to 1 and is positively related to the number of items considered, which makes it tricky to interpret. Nevertheless in social science a lower limit of .7 is commonly used, which is sometimes lowered to .6 for exploratory research (Hair et al, 1998), (Robinson et al, 1991), which this is. Cronbach's alpha is based on correlations, so although it reveals that items are correlated it does not necessarily imply that the items all represent the same dimensions
- Represent one and only one image dimension Factor analysis is a technique that can be used to explore the underlying structure of data (Hair et al, 1998). It can show whether the measures considered represent the same concept, or possibly are irrelevant. If measures load onto the same factor, they probably represent the same concept If a measure loads onto several factors, they do not have a clear interpretation. If a measure does not load onto any factor, it suggests the measure does not represent any of the concepts represented by the factors, and probably is irrelevant. Although factor analysis is in common use, the justification for commonly used minimum cut-off points for factor loadings is hard to find. In social science, loadings below 0.3 are usually ignored (Tabachnik, Fidell, 1983), (Hair et al, 1998). Factor analysis was used to check the a priori allocation of measures to image dimensions.

In the selection least attention is paid to internal consistency because of the limitations of the data available, and because at this stage the concepts are open to potentially valuable differences of interpretation which might be clarified during the analysis. Nevertheless, in the interests of simplicity measures that related to the same interpretation and showed internal consistency were made into a composite measure.

3 4.3.1.1.1 Conformity

The measures selected for conformity were

- Conforming to the school ethos (available at ages 13 and 15), i.e. never difficult to discipline, late without good reason or evading the truth to keep out of trouble, on the teacher's assessment
- Not being a poor worker at school (available at ages 13 and 15), on the teacher's assessment

A number of other potential measures of conformity were rejected, because few children exhibited them, these were being difficult to discipline at primary school or playing truant at age 13 or 15. Others were rejected because they were not clearly measures of conformity. These were being a dare-devil at age 13 or 15, having a poor attitude to school work at age 10, having interests with parents at age 13, and seeing their own parents regularly at age 36 and 43.

The disadvantage of the measures selected is that they only relate to childhood, and the measures relating to schoolwork could be related to educational achievement. More detail on the selection process and definition of the measures selected is given in Appendix A, section $A 1 1 and $A.2 3.

3.4.3.1.1.2 Sociability

The measures selected for sociability were

- Being very popular at age 13
- Making friends very easily (available at ages 13 or 15)
- Seeing friends regularly (available at ages 36 and 43)

A number of other potential measures of sociability were rejected because few children exhibited them; these were difficulties with siblings at 9 and difficulties with other children at 9. Others were rejected because their interpretation was not clear; these were happiness and having interests with friends at age 13. Nights out per week and visits to the pub per week at age 36 were rejected because they correlate with alcohol intake, so using them would almost certainly find a relationship between sociability and drinking. But, it could be argued they represent measures of drinking opportunities rather than time spent sociably with others.

The disadvantage of the measures selected is that they are not very consistent. The adolescence measures are qualitatively different from the adulthood measures, as the childhood measures are measures of social skills, while the adulthood measures could be seen as measures of social support. More detail on the selection process and definition of the measures selected is given in Appendix A, section $A.1.2 and $A.2.3.

3.4.3.1.1.3 Gender-identity

The measures selected for gender-identity were

- Being feminine at ages 13 and 15, i.e. never aggressive, competitive or rough on the teachers' assessment
- Being in a male dominated occupation at ages 36 or 43

A number of other potential measures of gender-identity were rejected because few children experienced them, such as a father more involved in their care at age 4. Others were rejected because their interpretation was not clear, such as avoiding attention at school. Finally for others considered, such as age at puberty, attending a single sex school, or having opposite sex siblings it is not obvious whether they press a child more into a traditional gender-identity or give the freedom to transcend it. More detail on the selection process and definition of the measures selected is given in Appendix A, section $A.1.3 and $A.2.3.

3.4.3.1.1.4 Religiosity

The measures selected were

- Going to Sunday school at age 11
- Thinking they had a religious upbringing at age 36
- Attending religious activities at ages 36 or 43
- Having religious beliefs at age 36

There were few other potential measures of religiosity. Partner's religious belief is also available but without clear evidence that own religious belief (rather than religious participation) has an effect it was not

included More detail on the selection process and definition of the measures selected is given in Appendix A, section $A 1.4 and $A.2 3

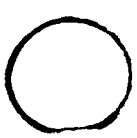
3.4.3.1.2 Public Image

The other aspect of image is the social side, i.e. what constitutes the public image of an activity. Public images are not necessarily static; for example, the range of acceptable behaviour for women has changed since the 1950s. So, it is a question of establishing the public image at a specific time for a specific age group. For example in the case of smoking it is the image of smoking to young adults in the early 1960s, while in the case of drinking it is the image of drinking for 30 somethings in the early 1980s Given the lapse of time it cannot be established directly by using questionnaires or focus groups. It is a case of using historic evidence to form an impression. This is inevitably a mixture of qualitative and quantitative analysis.

The aim was to establish activity by activity (i.e. for smoking, drinking, exercise and diet) how they rated on each of the image dimensions (conformity, sociability, gender-identity and religiosity) in the public domain for the NSHD. The approach was

- Look for any expressed norms, as one would assume they would tempt the more conformist. Sources are contemporaneous government publications, contemporaneous advice on school syllabus, i.e. encouraging physical education and discouraging smoking
- Look for any received norms. Direct sources are long-standing lay beliefs, enshrined in household manuals, etiquette manuals, contemporaneous popular magazines, advertising code of practise and the British Social Attitude Survey. Indirect sources are the implicit attitudes displayed in research questions and publications from the relevant time.
- Look at what people were actually doing at the relevant time; this is particularly helpful for gender-identity, as one can assume that activities dominated by men will have a more masculine gender-identity. Good sources are contemporary social surveys.
- Look at where government, commercial or individual funding was going, for example the provision for and coverage of men's and women's sport, on television, in newspapers
- Look at religious teaching and religiously inclined reforming social movements to understand what is involved in following a faith
- Look for public or private constraints on behaviour, e g. where is it acceptable to drink
- Look for the contemporary health education message, as that helps establish norms and how well known was it. Generally, a new message needs to be proven out in academic research, given credence by government pronouncements and then followed through by the health education profession. The number of articles in investigative journals, such as the British Journal of Preventive and Social Medicine, give an idea of the level of academic interest, while articles in the Health Education Journal give an idea of the level of health promotion interest

At this stage looking back it is almost impossible to validate these images as memories of the past may well be coloured by current knowledge. However going forward it would be possible to collect evidence on public images through the use of questionnaires or focus groups, at the same time as capturing information on current attitudes and behaviour



Given that establishing the public image of an activity involves substantial research and is specific to each activity, discussion of the public image of smoking, drinking, exercise and diet is given in the relevant results chapter.

3.4.3.2 Social trends

Social trends cover the engagement with historic forces, i e change over time. At an individual level one needs a marker of who is likely to be at the forefront of following a trend. At a population level one needs to be able to describe social trends in terms of these same markers, so that one can see how these match up and influence behaviour.

3.4.3.2.1 Individual level measures

As discussed (§2.3.2.2.2) it is hypothesised that individuals are motivated to follow trends by status seeking, with those with more status following trends more quickly. There is no well-validated, direct measure of status. Both where someone has come from and current social position may contribute to current status. Ways of measuring this are parental social class, and NSHD members' social class, using RG social class. This is not entirely satisfactory as RG social class is a measure of much more than status; it may also represents a person's level of education, income, type of housing and aspirations. The Cambridge scale might be more appropriate, but is not available for the NSHD and their parents. So, RG social class, and measures of an individual background (relating to family of origin) and generically referred to as background factors have been used as measures of status, and education and social circumstances also allowed for (as described later in §3.6.6), so as to isolate the effect of status. Precise definitions of these measures is given in Appendix A, section §A.2.4.

3.4.3.2.2 Population level trends

One advantage of measuring individual level interest in trends using social class is that one of the few ways in which behaviour has consistently been described over time is by gender and social class. Population level trends in behaviour by class and sex can sometimes be established from social surveys, contemporaneous academic research and contemporaneous market research. Trends can also be surmised in terms what is seen as socially acceptable behaviour for different social classes at different times, using the same sources and methods as for establishing the public image of an activity.

3.5 Validation

This section focuses on the validity of image dimensions and measures, and the distinctness of the categories, as these are concepts which have been introduced by this thesis, and are not in common use. Ideally one would like to be dealing with well-defined independent categories (education, social circumstances, agency and social trends) measured with well-validated 'measuring rods' whose value is proven in extensive use.

3.5.1 Image Validation

In terms of operationalising image, validation for each dimension of image is required to establish that

- Public image of an activity is correctly characterised

- Measures are reliable, i.e. measures the concept consistently (if not correctly)
- Measures are valid, i e. correctly represents the concept of interest
- Dimensions of image are valid groupings and reasonably independent

3.5.1.1 Accuracy of Public Image

Without new surveys, it is not possible to authenticate public images directly. It is a question of using as wide a variety of sources as possible. Sometimes it is possible to cross check an image with other data on the NSHD.

3.5.1.2 Measure reliability

Reliability is the consistency of the measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. In this case one would not expect complete reliability because often the measures represent different nuances on the same concept. In addition, this is categorical data (often with two categories) collected by different people at different times, so it is not surprising that this data rarely exhibits high correlations. Nevertheless, the measures finally selected for each dimension of image were more highly correlated and generally have acceptable Cronbach's alphas for exploratory research ($A 1). The main exception is the different ways of measuring sociability in childhood and adulthood, where all these measures together have a low Cronbach's alpha ($A.1).

3.5.1.3 Measure validity

If the measures are valid, they should be measuring the concept correctly. Ideally, there should be some 'gold standard' outside this survey for these concepts that could be shown to approximate to these measures. However in this case there is no gold standard, so the best one can do is expect them to predict other related behaviour in the NSHD. For example, one would expect the 'rebellious' to be more likely to be not responding, to be not working, or to be divorced. Those exhibiting religiosity should be less likely to be divorced. In fact, 'rebelliousness' in men is associated with not responding and not working. In women, it is associated with not responding and not being married. Religiosity in both sexes is associated with not being divorced or separated. It is not obvious how to validate gender-identity or sociability within the survey. It would be very desirable to validate these measures outside this survey.

3.5.1.4 Image Dimensions are distinct

Ensuring that the measures selected represent different dimensions of image and do not stray across dimensions was one of the selection criteria, and was done using factor analysis ($3.4 3 1.1). Factor analysis is not however a precision tool, and does not necessarily give one unequivocal answer, (Hair et al, 1998) so it was carried out with a variety of extraction methods and a number of different factors on the measures selected to represent the dimensions of image These different factor analyses generally tended to give consistent results ($A.3 1)

These analyses ended up with childhood measures of conformity, sociability, gender and religiosity in different groups (loading onto different factors). When the adulthood measures were considered as well generally the same original groups remained, some adult measures joined these groups appropriately (e g.

religiosity) and others (e g sociability) fell into new groups. Overall, the results suggest there are distinct groupings of the four image dimensions in childhood, but the sociability measures in childhood and adulthood might not be measuring exactly the same concept ($A.3.2).

3.5.2 Categories are distinct

The final question is whether the image dimensions are different from the other categories. (i.e. education, social circumstances and background/social trends). This was considered in two ways Did factor analysis put the image dimensions into different groups from the other categories and what is the relationship over time between image dimensions and the other categories? For example is conformity directly related to healthy behaviour, or is it that conformity contributes to educational success, which in turn contributes to healthy behaviour?

Factor analysis of all the selected measures was used as an initial check that the image dimensions were distinct from the other categories, and that did turn out to be the case as discussed in Appendix A.
In particular, it indicated that although the measures of social support and the image dimension of sociability look superficially similar, the social support measures are different from sociability measures. On the other hand, it could not reveal the complexities of the other potential relationships over time, which emphasises the importance of building models in chronological stages. Analysis of the relationship between childhood/adolescent aspects of image, education, childhood background and achieved non-manual social class showed that being more conformist, coming from a non-manual background and education were related to achieving non-manual social class. The childhood/adolescent measures of sociability were not relevant, and the measures of gender-identity and religiosity were only relevant if education was not included. More details on this analysis are in Appendix A. As such, it indicates that education could potentially mask the effect of some of the other measures, and it is necessary to check that variables are having an effect independent of social class, and not acting as proxies for it.

3.6 Analysis

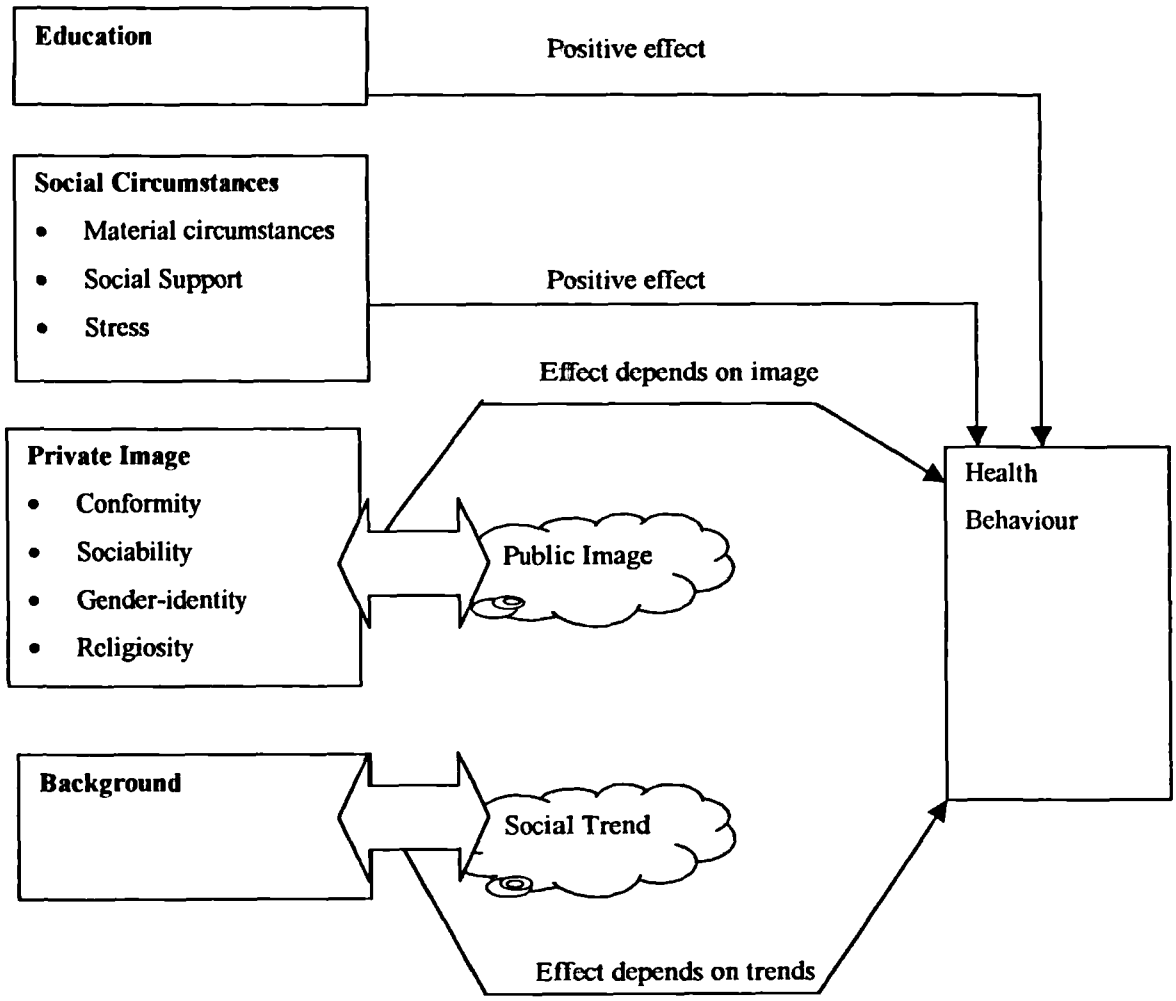
3.6.1 Hypothesis

Bringing together the literature review and this discussion, the hypothesis is that there are four categories of explanation for health behaviour, which are represented in this thesis by Education, Social Circumstances, Image and Background. It is hypothesised that all these have an effect on health behaviour, but it is not hypothesised how they interact or what pathways there might be between them or how all these influences fit together. On that basis, it is exploratory data analysis

Nevertheless in line with the broad outline of previous research it is hypothesised that more education and better social circumstances should be associated with healthier behaviour and change to healthier behaviour. The effect of image and background depends on the public image and social trends relating to each behaviour People whose private image of themselves matches the public image of a health behaviour will be more likely to carry out that health behaviour and to change to carrying it out, if recommended, because they will not encounter any conflict of identity. People who are motivated to follow social trends will be more likely to follow the latest trend in health behaviour; this may not necessarily be the same as

the health education message. What effect public image and social trends will have depends on what the public image and social trends are for each health behaviour. These are determined as set out in $3.4 3 2 1 for public image and $3 4.3.2 2 for social trends Results of this analysis are specific to each health behaviour, so are given in results chapters. However in each case the underlying mechanism is consistent, i.e. closeness of the match of image, and keenness to follow social trends, but it is not assumed that these will consistently be associated with healthy behaviour Figure 3.1 gives a schematic outline of the hypothesis that is going to be explored

Figure 3-1: Hypothesis



3.6.2 Outcomes

This thesis is about understanding the factors related to health behaviour and what mediates change. Health behaviour can be considered as an overall outcome (i.e a composite of the behaviours) or an individual outcome for each behaviour Given that the hypothesis assumes that the reasons for health behaviour go well beyond concerns with health alone, and may not have a consistently 'healthy' effect on each behaviour, it would be inappropriate to combine all the health behaviours into a composite outcome to start with, so the behaviours are considered individually

The objective is to evaluate health behaviour in response to public health messages, which means comparing behaviour to the contemporary health message, not later knowledge and/or messages. For many reasons, such as advances in knowledge or political considerations, the contemporary health education message is not necessarily the same as what is currently seen as optimal behaviour for health. Nevertheless, the outcome is following (or not following) the contemporary health education recommendation. The contemporary recommendation on healthy behaviour for smoking, alcohol, exercise and diet is given in the appropriate results chapter.

The beauty of the NSHD is that there is data both at the beginning of periods during which fairly clear health messages were promulgated, and somewhat later, i e data on smoking in 1966, 1982 and 1989, data on diet, alcohol and exercise in 1982 and 1989. This means it is possible to look at change relative to previous behaviour, i.e. to compare smokers and ex-smokers, or to compare those who stopped drinking over the limit with those who continued to do so. From a public health perspective the key issue is what leads people to initiate healthy habits and what makes people change from unhealthy habits to healthy habits. Conversely, it is also useful to know what makes people change from healthy habits to unhealthy ones, so that it can be prevented. The specific outcomes are

- 'healthy' behaviour near the start of a period of health education, i e. smoking in 1966, drinking, exercise and diet in 1982, this answers the question who initiated healthy behaviour
- responding to the health education message, i.e. changing from unhealthy to healthy behaviour during the period of health education, i.e. between 1966 and 1982 for smoking and between 1982 and 1989 for drinking, exercise and diet
- disregarding the health education message, i.e. changing from healthy to unhealthy behaviour during the period of health education
- as a final check conditional change was also examined, i.e. what was independently associated with healthy behaviour in 1989 (allowing for health behaviour in 1982)

The only exception to this is smoking, where taking up smoking after the age of 20 was not considered because it was rare, less than 2.5% of the NSHD appeared to have started smoking after age 20. However, in other places at other times with different patterns of smoking initiation, it might well warrant investigation.

3.6.3 Method

The question is how to measure the relative impact of various measures on dichotomous outcomes, where almost none of the measures are direct measures of the concepts of interest, and most of the measures are categorical. Since some of these are relatively untried concepts, it is very much data analysis rather than complex modelling, such as structural equations modelling. So, a simple robust technique that will work on rather 'messy data' and that does not rely on having a good understanding of relationships within the data is required

Logistic regression is suitable for this type of analysis. It is a simple, robust technique designed for dichotomous outcomes that yields easily interpretable results. The simplicity lies in the fact that essentially it is similar to regression. Regression fits the best line to a scatter of points on a plane; multiple regression fits the best line to a scatter of points in a multi-dimensional space Logistic regression

transforms the dependant variable before fitting a curve, and uses a slightly different rule for selecting the best fit (maximum likelihood rather than least squares); nevertheless, the basic idea is the same. Logistic regression is robust because it does not have strict assumptions about relationships within the data, i.e it does not require multivariate normality or equal variance-covariance matrices across groups (Hair et al, 1998). The results are easy to interpret because the estimated coefficients can be translated into the probability of an event occurring compared with it not occurring; thus giving the effect on the outcome of the presence or absence of a 'risk' factor. Interactions are also straightforward to interpret Interactions occur when the effect of one factor depends on the level of another; for example, if a factor has a different effect on the outcome for each sex. Most of the explanatory factors in this analysis are dichotomous, so two-way interactions mean that the effect of two factors together is less (or more) than would be expected from the effect of each one on its own.

3.6.4 Missing data

The NSHD is a class stratified random sample, containing 5362 people. Data has been collected from them on more than 20 occasions. Inevitably, the data is incomplete. Some of the NSHD members have died, emigrated, refused to take part or proved impossible to contact on one occasion or another, so that by 1989 there were 3262 contacted. Despite this due to the effort and thought put into maintaining contact the NSHD has remained broadly representative (Wadsworth et al, 1992) of the native born population of Great Britain. Nevertheless, it still has to be considered whether the missing data might affect the results.

Missing data is classically divided into three types, which have different implications for the use of the remaining data (Little, Rubin, 1986). Ideally, if data is missing, it should be missing completely at random (MCAR) with no consistent underlying process which stops the observed data being a random sample, i.e. the probability of missing data is not related to the outcome or the explanatory factors. In this case, the missing data is ignorable, and the only effect is to reduce the size of the sample Missing data is more of a nuisance if the probability of missing data depends on an explanatory factor, but not on the outcome (MAR). In this case, the data for an outcome is not completely representative, and the effect is that measures such as means cannot be generalised, but relationships between explanatory factors and the outcome are often unaffected (Little, Rubin, 1986), though the sample size will be smaller. The worst sort of missing data is when the probability of missing data depends on the outcome that would have been observed, and possibly the explanatory factors. In this case, the missing data cannot be ignored. For the NSHD the effect of missing data can be assessed by investigating why missing data has occurred, and whether there are any particular outcomes that might not be observed.

Overall, the pattern of non-response is that in childhood, the children of non-manual parents responded least, and in adulthood, the children of manual parents responded least. Usually if a NSHD member responds they provide relatively complete information, with some exceptions, which are considered later. The net result is that a subset of people with complete childhood and adulthood data (on the measures and outcomes of interest) is often not different from the original sample. The main exception to this is subsets containing teacher's assessments and outcomes in 1966 or 1982 which miss proportionately more from non-manual backgrounds, because the independent schools were less likely to participate. Children from independent schools were generally not rated differently on the teachers' assessments from other children,

apart from two cases. They were more likely to have a positive attitude to school work at 10, and to be sociable Attitude to school at 10 does not matter as other measures of conformity have been used Sociability could matter, and missing those with skills may make it harder to detect any effects, or may explain why sociability does not exhibit reliability. Overall, this pattern of non-response means that it is acceptable to use subsets with complete childhood and adult data, as long as the respondents provided information on the outcome in question It is also re-assuring if the subset matches the original social composition of the sample. The analysis behind this summary is in Appendix B.

Overall, the pattern of providing outcome information is that if an NSHD member responded they did almost always provide information on their smoking and exercise habits, but they did not always provide the diet diary which has been used as the source of diet and alcohol outcomes. Therefore, for the diet and alcohol outcomes it is possible that the data is neither MCAR nor MAR (Longford et al, 2000). One can easily stereotype heavy drinkers with unusual diets as being more difficult to contact and finding it less easy to fill in their diet diaries, particularly as frequent pub-goers were less likely to provide diaries. The question is did this occur or not. 73% of the NSHD members contacted in 1982 provided diet diaries and 70% did so in 1989. Considering whether those who provided a diet diary in one of 1982 and 1989 had a different diet or alcohol intake from those who provided a diet diary in both of 1982 and 1989 provides a partial answer. There is no evidence those who only provided one diary had significantly different alcohol intakes, but they did report significantly different diets However there was little evidence that the relationship with the explanatory factors was affected, i.e. people who did not provide diet information did not have a different relationship with the explanatory factors. Overall, this means that use of the diaries will probably provide acceptable results, possibly better for alcohol than diet. Again, it is re-assuring if the subset used matches the original social composition of the sample. The analysis behind this summary is in the relevant results chapter, as it is specific to each outcome.

Bearing these considerations in mind, that the data is broadly representative, that the data which is missing is probably not affecting relationships with the outcome and that the aim is data analysis rather than precise modelling, imputation of missing values was not carried out, and any individual with missing data on any variable was dropped. Nevertheless, steps were taken to minimise the risk of biases caused by missing data

- Minimise the number of collection points used, to keep the data representative
- Minimise the number of different variables used in an analysis, and if a large number are used, once the totally insignificant have been weeded out, try again with fewer measures and a larger and more representative subset.
- Check that subsets on which multivariate results are based match the original social composition of the NSHD

3.6.5 Power

For any analysis to be meaningful there must be sufficient data to be able to detect the effects being considered. Statistical power is a measure of the probability that a false null hypothesis is accepted, i.e. it is concluded that a variable is not having an effect when it is By custom and practise, power is usually set with a lower limit of 0.8 (Hair et al, 1998) for exploratory research. Power depends on the statistical technique, the sample size, the size of effect being sought, the frequency with which the outcome occurs,

the distribution of the explanatory variables and when considering several variables together the number of such variables and the relationship between them. Power can be estimated using rules of thumb or estimated more exactly Rules of thumb suggest that sample sizes of 1000 are large for most multivariate analysis (Hair et al, 1998). In this research, depending on the outcome being considering the sample sizes generally vary between 100 and 1500, which suggests there is a risk of too little power. Hence, power for the various logistic regression analyses carried out here has been estimated more precisely using the PASS software from NCSS Statistical Software. PASS estimates power for logistic regression based on the routines of Hsieh (Hsieh et al, 1998).

Power analysis was carried out for the samples sizes, outcomes frequencies, distribution of the explanatory variables and correlations between explanatory variables likely to be encountered in this research to determine if any very small effects would be detected or very strong relationships would be needed to detect any effect. This analysis suggested that for the largest samples (1000-1500) likely to be encountered power would not be too large in that the smallest effect likely to be detected is not negligible (minimum odds ratio is about 1.4). For medium sized samples (500 to 1000) there would be sufficient power to detect effects with odds ratios from about 1.5 upwards. The size of the minimum odds ratio likely to be detected as significant goes up as the split of explanatory variables becomes more uneven and the outcome of interest becomes less common. For this range of sample sizes if the split on the explanatory variable is more extreme than about 20%/80% and the outcome occurs for less than about 20% then only stronger relationships (equivalent to odds ratios over 2.1) are likely to be detected. As the sample sizes become smaller than 500, stronger relationships are needed to detect any effects. Where a particular analysis may suffer from insufficient power because of the particular combination of sample size, outcome frequency and distribution of explanatory variables, it is highlighted in the relevant results section.

3.6.6 Analysis Procedure

In order to take account of all the issues discussed the data has been analysed chronologically to build up a picture of the measures contributing significantly to each of the outcomes described above, when allowing for all the other measures. For consistency and simplicity the analysis was carried out in the same way for each possible outcome, i.e. whether it was identifying the measures contributing to starting smoking by age 20, or those contributing to changing from drinking over the limit in 1982 to drinking under the limit in 1989.

The analysis procedure was this First, identify the childhood measures relevant to any outcome, allowing for the other possible childhood measures. Next building on that model of childhood measures, identify any preceding or contemporary adulthood measures, which were relevant to the outcome as well as, or instead of, the childhood measures. If a childhood measure was replaced or changed by the introduction of an adulthood measure, that suggests a possible pathway.

In all cases the relevance of a measure was identified as follows. First, identify if the outcome appears to be contingent on that particular measure on its own. Chi-squared tests indicate contingency (Chatfield, 1970). In this analysis, the threshold for possible contingency has been set very high ($p < .20$) to allow for the possibility that there is confounding by another measure, masking the effect of that particular measure

(Hosmer, Lemeshow, 1989). Second, identify if any of the measures which do not exhibit any contingency ought to be considered for other reasons. The main one here is father's social class to allow for the stratification of the sample Third, identify all the possible significant measures when they are considered together using backwards stepwise logistic regression and a significant level of .05. This significance level is arbitrary custom and practise, so as this is exploratory data analysis it has also been noted if any measures fall just outside this significance level. Fourth, check for interactions between the remaining measures from the stepwise procedure. As this is exploratory data analysis, and because it is possible to think of explanations for almost any inter-relationships as regards behaviour, all second order interactions were checked for with a significance threshold of .10, because of the low power of that test (Greenberg, Kleinbaum, 1985). Fifth, check that the model's estimates fit the data at an acceptable level, i e. that the model predictions of which category an observation should go in are not significantly different from the observed. The Hosmer and Lemeshow Goodness-of-Fit Test indicates this. A value of .05 or less indicates that the model is a poor fit (Hosmer, Lemeshow, 1989).

Because of the pattern of response in this data, any analysis using a large number of measures, particularly childhood measures, often has a small number of observations. In addition, there is no guarantee that stepwise regression will find the model which represents the underlying data most accurately. So, in order to make best use of the data, and to have an additional check on the results.

- Only one of a group of similar measures was used, typically the one with the least missing data
- Once completely irrelevant measures had been identified, the analysis was repeated with data for all the relevant measures, as this provides more precise estimates, usually a larger and slightly more representative sample. (Greenberg, Kleinbaum, 1985) and often confirmation of the same set of measures as significant.

Finally, to make best use of this longitudinal data, and to identify prospective relationships, where several measures of the same concept at different times are available, prospective measures are preferred to contemporary measures.

It is possible, and expected that some things will have a different effect on men and women's behaviour. There is a risk that a stepwise selection procedure for both sexes might miss sex specific effects, so men and women have been analysed separately throughout. As a check, that there really are different effects by sex, a combined model containing all the significant measures for each sex, and of course sex, was examined for interactions between explanatory measures and sex. An interaction with sex indicates that the measure is acting differently for men and women. Considering men and women separately has the advantage that there is less risk of missing the significance of measures which operate differently by sex, but it does mean that overall the results may be less convincing and may be less easy to interpret. The particular measures which best represent a category are not quite the same for men and women. This represents slight nuances in what is important for men and women, and appears because men and women have been analysed separately These are valid differences in that in many cases different measures within a category do inter-act by sex, such as home-ownership. These differences do not invalidate the overall results. If men and women had been analysed together, the same categories would have appeared However, the nuances of what is important to men and women would have been lost.

This stepwise modelling procedure has the advantage that it usually produces a small set of measures. It reduces the risk that measures which act together will get lost, as these can be detected by looking for measures whose effect changes dramatically when another measure is eliminated (Greenberg, Kleinbaum, 1985).

This approach also has some disadvantages. If measures are strongly correlated then the selection of one over another is essentially arbitrary (Hair et al, 1998). This does not matter if the measures represent the same category or the same image dimension. It makes a difference to the interpretation if the measures represent different categories, and one just fails to be significant. In this case, each measure is tried without the other to get a better idea of which one or both really matters, and the measure just failing significance is noted in the text.

The NSHD data is stratified by father's occupation at birth, approximating to manual and non-manual social class. Weighting is carried out when reporting prevalence. Weighting is desirable if there are expected to be different relationships by stratification variable. There is no particular reason to think that relationships vary by parental social class, so the data has not been weighted for analysis, however to check this is valid two additional analyses were undertaken. Firstly, a re-analysis using weighted data to see if it did produce different relationships. Secondly a check for interactions between parental social class and explanatory measures. The presence of interactions suggests that relationships vary by social class in which case weighted analysis would have been better.

All in all this is exploratory data analysis. It should be validated further against other data.

3.7 Summary

This chapter has explained how each of the categories of explanation for health behaviour is operationalised and measured. It has explained the hypothesis in more detail, and how the data is going to be analysed, and the limitations with the NSHD data. The next step is to see how well these categories explain some health behaviours, i.e. smoking, drinking, exercise and diet.

4 SMOKING

4.1 Introduction

Smoking is a major factor in preventable mortality and illness, as a risk factor for heart disease and cancer (McGinnis, Foege, 1993) Smoking is a health behaviour that has social, cultural and economic baggage attached, and the prevalence of which has been subject to large scale swings of fashion (Goodman, 1993). During the lifetime of the NSHD members' attitudes to smoking have become progressively more negative. Cigarette smoking rates have fallen from 69% for men and 39% for women in 1948 to 27% in 1994 (28% men and 26% women) (Hobson, Henry, 1948), (ONS, 2000). In addition in 1948 some men (12%) were pipe smokers, i.e. smoked only pipes (Hobson, Henry, 1948) Given these changes in line with health education and the significant numbers still endangering their health by smoking, it is important to understand why these changes have taken place and why some still smoke.

4.2 Hypothesis

The hypothesis is the same for all health behaviours considered. It is set out in chapter 3.6.1 and Figure 3.1.

4.3 Health Education Message

Doll and Hill reported their prospective findings in 1954 showing that the more doctors smoked in 1951 the more likely they were to die of lung cancer or to a lesser extent coronary thrombosis over the next 27 months (Doll, Hill, 1954) This followed a number of British papers in the early 1950s showing an association between smoking and lung cancer (Doll, Hill, 1954). Local authority health education was initiated in the late 1950s Cigarette advertising on television was banned in 1965 (Hardy, 2001). Health warnings were added to cigarette packets in 1971 (Hardy, 2001). With the formation of the pressure group Action on Smoking and Health in 1971 there came sustained and effective health education (Hardy, 2001). The message was re-enforced by the introduction of non-smoking provision in public places (Wark, 1986) and worksites (Parry et al, 2000) from the 1980s onwards.

There was an awareness of the dangers of smoking in the 1950s. 'Perhaps the most interesting aspect of these findings is that 'anti-tobacco' attitudes are widespread in the general population and are by no means uncommon among smokers. The belief that smoking was harmful to health was widely held....' (Cartwright et al, 1960). This may have been a general awareness that smoking was not good for long-term health rather than specifically about the dangers of lung cancer The public health message on smoking and cancer began to filter through from the late 1950s (Carr-Saunders et al, 1958). In 1957 a survey on cancer knowledge found that 22% spontaneously mentioned smoking as a cause of cancer and another 78% had heard of a possible relationship (Cartwright, Martin, 1958). By 1982 almost everyone should have known that smoking was unlikely to be good for you. The NSHD first collected information on smoking habits in 1966.

4.4 Outcome

Most smokers start in adolescence and spend years giving up (USDHHS, 1994) so there are three key groups made up of never-smokers and ever-smokers, and ever-smokers divide into ex-smokers and smokers. This could be considered as a polychtomous outcome at age 43 However, this would reduce the size of the sample, as more of the NSHD provided information at 20 (which included their smoking habits) than responded at 43. It makes better use of the data and is more easily comparable with other studies to consider never-smokers compared with smokers and ex-smokers compared with smokers. Ex-smokers have been considered in two groups, those who became ex-smokers by age 36, and those who became ex-smokers by age 43, to see if there is any difference in the pattern of giving-up at different stages of life and coincidentally for the NSHD members different periods of historical time. Thus three outcomes are considered: never smoking, giving up smoking by age 36, and giving up smoking by age 43.

Never-smokers are defined as those who had not smoked regularly by age 20, or if that information was not available, did not report being smokers or ex-smokers at age 26 or 31. Ever-smokers are defined as those smoking at 20 or who had smoked regularly before age 20, or if that information was not available, reported being a smoker at age 26 or 31. Ex-smokers at age 36 or 43 are ever-smokers who are not currently smoking. This is not the only possible way of defining these groups, or using the information available. For example never-smokers could be defined as those who had not smoked by age 26, or occasional smoking before age 20 could be counted as smoking. Arbitrary choices have to be made about NSHD members who provide inconsistent information. The definition was chosen on the basis of using contemporary data and obtaining larger samples that most closely matched the original social composition of the NSHD.

Pipe smoking and cigar smoking have been ignored. For the NSHD members pipe smokers were a dying breed, in 1948 36% of men aged over 65 were pipe-smokers (i.e. smoked a pipe but did not smoke cigarettes as well), while only 3% of men aged 16-24 did so (Hobson, Henry, 1948). In 1966 at age 20 1% of the NSHD members were regular pipe smokers. Pipe smoking and cigar smoking also have a different public image from cigarette smoking. For example the image of a woman pipe smoker in the 1950s has all sorts of gender connotations.

4.5 Previous Research

In reviewing smoking research there are several issues. The characteristics of smokers may not be the same at a time when 58% of the population smokes than when 27% do. The characteristics of ex-smokers may not be consistent over a lifetime, i e. the reasons for giving up at 20 might be different from the reasons for giving up at 40. Socio-economic status is often treated as a unitary concept variously represented by measures of education, material status or social class. Smoking trends vary by time and place (Graham, 1996), (Cavelaars et al, 2000), so research from different times and places may not be directly comparable. Lastly much research considers smoking prevalence rather than being able to compare never smokers with ever smokers and ex-smokers with smokers.

4.5.1 Education

It is commonly thought that less education is consistently associated with higher smoking rates, apart perhaps from in developing countries (Jarvis, Wardle, 1999). Currently less affiliation and success at school is associated with smoking initiation (Choi et al, 1997), (Derzon, Lipsey, 1999), (Conrad et al, 1992), (Hamynen et al, 1987), (Lifrak et al, 1997) or with less teenager quitting (Hu et al, 1998). However results for adults are less consistent. In many places the more educated smoke less (Cavelaars et al, 2000), but currently in the Baltic republics there is no clear relationship between education and women's smoking (Pudule et al, 1999). Some find differential change in prevalence rates by educational level (Osler et al, 2000), (Brannstrom et al, 1993) or for women only (Bennett, 1995), (Pekkanen et al, 1995), and some do not for men only (Bennett, 1995), (Pekkanen et al, 1995). These changes could be due to either lower initiation rates among the better educated or higher quit rates. The few studies looking at quit rates find more education associated with quitting (Hatziandreu et al, 1990), (Graham, Der, 1999) (women only), but not consistently so (Lundberg et al, 1991), (Nordstrom et al, 2000) (men only).

It may be that these somewhat confusing results are the result of a conflation of different processes. From a health psychology perspective one would expect the more educated to follow the health education message faster. However there are also changing historic trends, which may not be consistent with health education, which it is hypothesized should be followed differently by social class, and education is a marker of social class. For clarity and simplicity these trends are discussed once under background not education, even though some may have delineated historic trends in terms of changes by educational level.

4.5.2 Social circumstances

4.5.2.1 Material circumstances

Material circumstances affect the choices people can make. There is evidence that poverty is currently associated with more smoking initiation (Oakley et al, 1992), higher smoking prevalence (Bartley et al, 1999), (Graham, Blackburn, 1998), (Flint, Novotny, 1997) and less quitting (Flint, Novotny, 1997), even allowing for aspects of socio-economic status. This is not a relationship which is necessarily constant across time and place, for example smoking rates do not vary by income in parts of Eastern Europe (Bobak et al, 1999). Price is a barrier to consumption (Sato et al, 2000), (Russell, 1973), and for teenagers their own lack of income can be a barrier (Tyas, Pederson, 1998), (Oakley et al, 1992).

Unemployment is thought to be a risk factor for smoking (Jarvis, Wardle, 1999). However studies of those who became unemployed have not found this (Osler, 1995), (Leino-Arjas et al, 1999), though it may be that smokers are more likely to become unemployed (Leino-Arjas et al, 1999) Labour force participation by women has been suggested as reason for women smoking, because of the relationship between women smoking and emancipation. However comparing women's labour force participation and smoking prevalence in several countries does not substantiate this (Waldron, 1991)

So the weight of evidence is that there could be a relationship between material deprivation and more smoking independent of the social trends in smoking mediated by social class, for which material

circumstances are another marker. The explanation is along the lines that cigarettes are a 'cheap' luxury and an effective coping mechanism (Graham, 1987).

4.5.2.2 Social support

Intact two-parent families are consistently protective against smoking initiation in adolescence (Tyas, Pederson, 1998), (Isohanni et al, 1991), (Karvonen, Rimpela, 1996) and being a smoker (Wolfinger, 1998). Higher quality parenting (i e. more connected, supportive and encouraging of autonomy) may also be protective (Chassin et al, 1998), (Stice, Barrera, 1995). In later life marriage and children are associated with quitting (Rice at al, 1996), (Jarvis, 1996), (Bjornson et al, 1995).

In general wider social support should help promote better health behaviour, through moderating stress, which makes healthy behaviour difficult. However there is not much evidence that this is the case for smoking. In adolescence social support is sometimes related to more smoking, particularly in girls (Lifrak et al, 1997). In adulthood there is some evidence that some forms of social support may reduce the risk of being a smoker for women (but not men) (Romano et al, 1991) or increase the chance of quitting (Lindstrom et al, 2000).

4.5.2.3 Stress

Historically cigarettes were seen as helping people cope with stresses and strains. Food and clothing were rationed in WW2, but "The Government never rationed beer or tobacco, the other major male self-indulgences" (Calder, 1969). Considerable effort was expended on ensuring availability for the troops as "Tobacco and cigarettes ranked with beer as luxuries which had become necessities" (Miller, 1971). For civilians cigarettes were sought out and were (often in the shape of obscure and disliked brands, e.g. Pasha) available (Longmate, 1971). The view of smoking as a necessity of life and a comfort is reflected in the contemporary press and government action, 'Adequate pay, good food, cigarettes and comforts, pep talks and sing-songs may all in their several ways be relevant to morale' (Mace, 1949). In 1948 pensioners were provided with tobacco tokens to compensate for increases in cigarette duty (Cmd, 7834, 1949).

Considering stress in general (and other markers of psychological health, such as low self-esteem), there are long-standing lay beliefs that stress increases smoking. Adult smokers are more likely to have experienced mental illness (Lasser et al, 2000), to have depression and anxiety symptoms (Jorm et al, 1999) or be suffering from stress, however defined, (Romano et al, 1991), (House et al, 1986), (Tagliacozzo, Vaughn, 1982). It is not quite clear how this relationship works. It could be stress and depression leading to smoking initiation, as found by some (Escobedo et al, 1998), (Patton et al, 1998), (Breslau et al, 1998), but not others (McGee et al, 1998) It could be the stressed or depressed finding it harder to quit, for which the evidence is mixed (Breslau et al, 1998). It could be that smoking causes depression, as has been found in one study (Wu et al, 1999). It could be that smoking is caused by other factors that also cause depression

At the moment the weight of evidence is that depression is associated with smoking initiation and greater difficulty in giving up.

4 5.3 Image

Smoking is clearly understood to have a public image, which has been investigated in various ways using different ideas on image (Amos et al, 1997), (Bland et al, 1975), (Cooper et al, 1989). This discussion describes the public image of smoking along the four dimensions of image (§3.2.1), and what evidence there is that people whose own image matches that public image are more likely to smoke.

4.5.3.1 Conformity

Smoking advertising has capitalized on the image of individuality and freedom, for which the Marlboro man is an icon. Adolescent smoking incurs disapproval from government, parents and schools. It was (and is) illegal for the under 16s to buy cigarettes (Walker, 1980). Cigarette smoking is also a pre-requisite for other illegal activities, such as smoking cannabis.

One would expect rebelliousness to be associated with starting to smoke and being less likely to give up smoking. Rebelliousness has consistently been associated with starting to smoke (Tyas, Pederson, 1998), (Lipkus et al, 1994), (Hamynen et al, 1987), (Clayton, 1991). It is less often considered in the context of giving up. One study found the personality attribute of rebelliousness had no effect on giving up (Lipkus et al, 1994). However personality attributes are not quite the same as exhibiting behaviour.

4.5.3.2 Sociability

Smoking is often seen as a way of coping with social situations. Reasonably contemporary studies talk of "the girls' own ideas of the stereotype of a girl who smoked being 'with it' and popular, and generally a 'socialite'" (Poulton, 1973). For young adults smoking had the advantage of appearing to confer sophistication and adult status (Bynner, 1969).

One would expect sociability to be associated with starting to smoke and not giving up. Peer-orientation, sociability or extraversion is often associated with smoking initiation particularly for girls (Lipkus et al, 1994), (Clayton, 1991), (Oakley et al, 1992), (Hamynen et al, 1987), (Emmons et al, 1998), (Michell, Amos, 1997), (Cherry, Kiernan, 1976). Sociability is less often considered in the context of quitting. In contrast, one previous study of the NSHD found, for men, extraversion, which is not necessarily the same as sociability, was associated with quitting (Cherry, Kiernan, 1976).

4.5.3.3 Gender-identity

Tobacco smoking was socially unacceptable for women into the 20th century. 19th century etiquette books proscribed women smoking (Wildeblood, Brinson, 1965) By 1920 women were responsible for less than 2% of the UK tobacco consumption (Todd, 1975).

The Second World War changed attitudes to the acceptability of women smoking. Women were taking over men's jobs, e g. in munitions factories, and possibly their habits Women had greater freedom and independence thrust upon them (Addison, 1995). Nevertheless smoking was still going beyond the boundaries of women's roles, and was always slightly resented (by men). Phrases along the lines of 'before women are wrongly accused of causing all the cigarette shortages' crop up in a range of

contemporary sources, (Browne, 1950), (Blythe, 1948). Contemporary discussions of smoking take the association with masculinity for granted (Lawton, 1962).

For the NSHD smoking was a more masculine activity. Men were more likely to smoke and smoked more heavily (Browne, 1950), (Todd, 1959). Smoking was more common in masculine occupations; in 1958 70% of the Forces smoked as compared with 60% of all men (Todd, 1959). A reasonably contemporary study found smokers being seen as 'tough' (Bland et al, 1975) One study found young women smokers had a more masculine image (Cooper et al, 1989).

One would expect that those who saw themselves as more masculine would be more likely to smoke and less likely to give up. There is no evidence on this point.

4.5.3.4 Religiosity

Since its introduction in Britain smoking has been condemned as irreligious and was opposed by some religious movements (Walker, 1980) Smoking falls into the category of unnecessary indulgences. 'A third habit which, like betting and drinking, often comes under criticism for extravagance, has now come under additional criticism because of its relation to disease. That habit is smoking.' (Carr-Saunders et al, 1958).

One would expect religiosity to be associated with less initial smoking and more giving up. Religiosity is associated with lower smoking rates (Cartwright et al, 1959), (Koenig et al, 1998) and less smoking initiation (Emmons et al, 1998). Though it does depend on how religiosity is defined. One study that looked at religious belief, rather than active participation, did not find any association with smoking initiation (Krohn et al, 1983). Religiosity was found associated with more quitting in one study (Strawbridge et al, 1997).

4.5.4 Social Trends/Background

Historically in Britain men's cigarette smoking started in the 1890s (Todd, 1959). Currently men's smoking is usually associated with lower SES, (ONS, 2000), (Jarvis, Wardle, 1999) except in some developing countries (Yu et al, 2000). Women's smoking started in the 1920s in the UK (Todd, 1959), somewhat later in Northern Europe and later still in Southern Europe, for example in the mid 1960s in parts of Spain (Borras et al, 2000) and Italy (La Vecchia et al, 1995). Currently smoking is more prevalent among lower SES women in the UK and Northern Europe, but not necessarily in S Europe (ONS, 2000), (Jarvis, Wardle, 1999), (Borrell, 2000). In countries where women adopted the smoking habit early, an initial positive social gradient in smoking has now become an inverse social gradient (Pekkanen et al, 1995), (Bennett, 1995). In countries such as Spain, where women adopted smoking later, a positive social gradient still exists (Borrell et al, 2000). These upward and downward trends in smoking prevalence have been explained by a diffusion process led by younger, more educated men of higher socio-economic status, who were the first to start smoking and have been the first to give up with women following the same pattern years later (Waldron 1991), (Graham 1996), (Cavelaars et al, 2000).

These trends make it difficult to interpret any studies investigating the relationship between social class and smoking prevalence, or quitting Results will depend on the age and sex of the subjects, the country

and time period being studied and what other socio-economic variables are considered. Hence somewhat inconsistent findings, for example (Bartley et al, 1999), (Borrell et al, 2000), (Tuinstra et al, 1998), (Bewley et al, 1973). So this review is going to focus on identifying the social class trends in Britain for the NSHD. Trends in smoking by social class in 20th century Britain can be gleaned from market research, lung cancer deaths (assuming the main cause is smoking) and contemporary surveys.

Figure 4.1 shows cigarette smoking habits by age and social class in 1948/49, taken from market research. The Hulton Readership Survey was based on a large sample of civilians in Great Britain aged over 16 (Browne, 1950), (Hobson, Henry, 1948) The sample was designed to match the population for sex, age, social class, size of locality, region and marital status. The interviewers were trained and supervised. This data comes from one of a series of surveys, which were used as a source by other social surveys (Carr-Saunders, 1958). It is consistent with other later market research, (Todd, 1959). which is not surprising as the all data collection was sub-contracted out to the same firm - Research Services Limited. The social class definitions were based on occupation, appearance, speech, type of house and district lived in. AB is described as 'the well-to-do' and the 'middle-class'. C is described as 'the lower middle class'. DE is described as 'the working class' and 'the poor'. Overall these groupings are probably comparable with RGs social classes; AB as RG I&II, C as RG IIINM and DE as RG IV and V. The proportion in the working-class and poor is 71% compared with 64% classed as non-manual in the 1951 census (Halsey, 1988). It is very likely that these groups represent relative differences in status, particularly as they used cues such as appearance and speech in the groupings, and it is differences in smoking behaviour by status groups that is important to this thesis

Assuming that smokers in different social groups do not have differential death rates, which was the case later (Marang-van de Mheen et al, 1999), (Pollock et al, 1997) Figure 4.1 shows that

- Smoking started first amongst social classes AB (well-to-do and middle classes) and then over time spread to other social groups, as seen in the 65+ group of men.
- Smoking started being given up or never initiated amongst social classes AB first
- Women and men are following the same pattern with a time lag of about 20 years for women

Figure 4.2 shows the number of cigarettes smoked by age and social class in the late 1940s from the Hulton Readership Survey (Browne, 1950), (Hobson, Henry, 1948). It shows non-manual men smoking more heavily initially but eventually the trends reversing.

Figure 4-1: Cigarette Smoking in the late 1940s, percentage who smoked

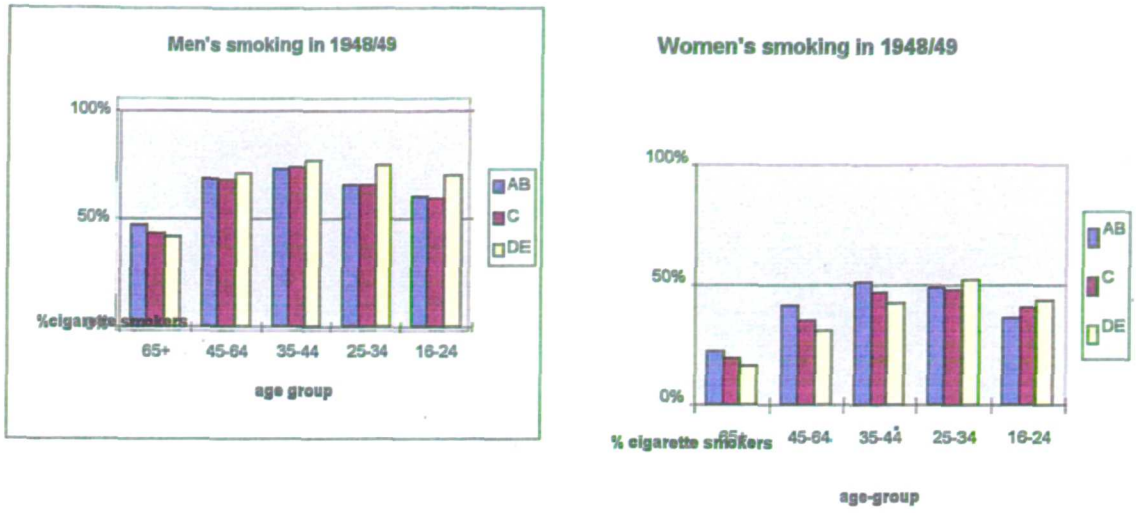


Figure 4-2 : Cigarette smoking in the late 1940s , amount smoked

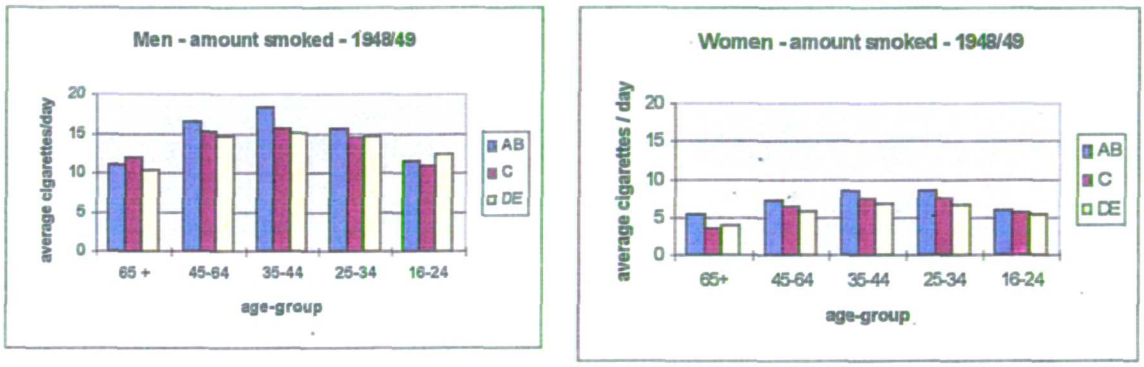
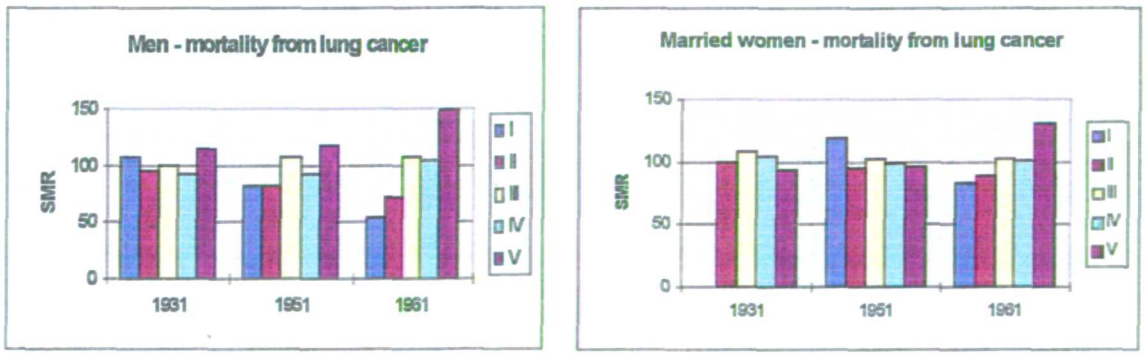


Figure 4.3 shows lung cancer mortality trends for England and Wales taken from the 'The Registrar General's Decennial Supplement' (GBRGO, 1938), (GBRG, 1957), (GBRG, 1969). This shows initially no social class differential, and a higher death rate for women in social class 1 up to 1951, and then higher death rates in the manual group emerging by 1961.

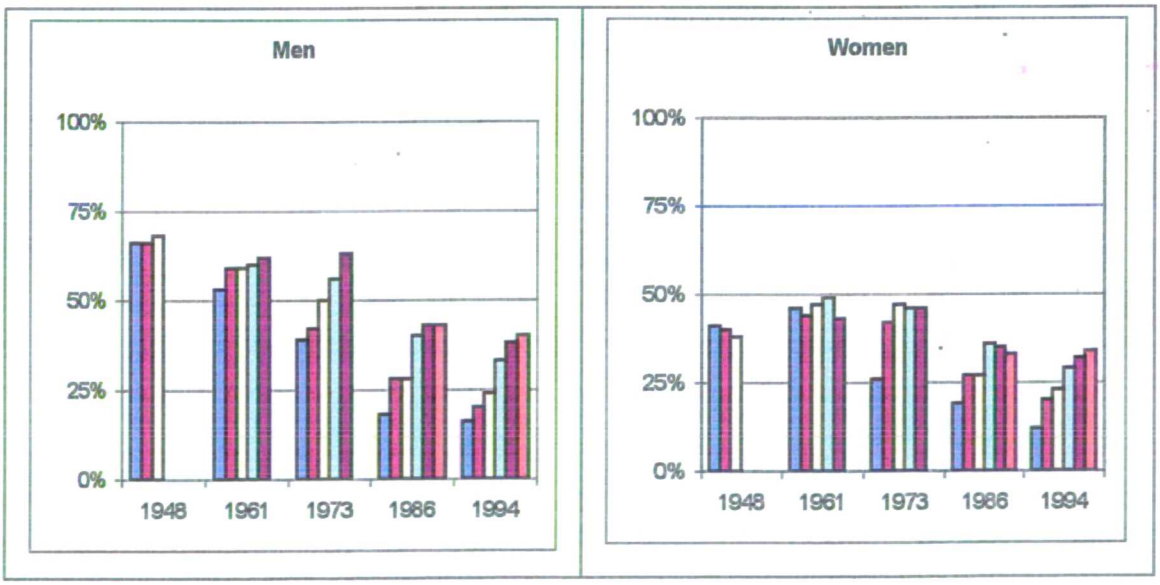
Figure 4-3 : Lung cancer mortality trends



In 1958 a survey found 'A higher proportion of the men in semiskilled and unskilled manual employment [social classes IV and V] were regular smokers than of those in skilled manual occupations [part of social class III], while the proportion was lower still among the professional and black coated group [I and II and the rest of III]... 'Below the age of 55 middle-class women smoked rather less than those in other groups, while among older women the opposite held; but the differences were not statistically significant' (Cartwright et al, 1959).

Figure 4.4 shows smoking rates by social class from 1948 to 1994 at approximately 12-year intervals (Hobson, Henry, 1948), (Todd, 1975), (ONS, 2000). These figures are not exactly comparable, as the social class categorizations are slightly different, and the figures for 1961 and 1973 only count manufactured cigarettes. The social classes are shown in each year from 'highest' to 'lowest'. In 1948 the categories are AB, C, DE. In 1961 and 1973 the categories are RG I, II, III, IV, V and in 1986 and 1996 they are Professional, Employers and managers, Intermediate and junior non-manual, Skilled manual and own account non-professional, Semi-skilled manual and personal services, Unskilled manual. Nevertheless there is no reason why the overall pattern should not be valid. This shows little difference in cigarette smoking rates by social class in 1948, though men look as if they are moving towards lower rates in the non-manual groups and women are still showing higher rates in the non-manual groups. Differences by social class emerge for men by 1961 and for women by 1973. Differences become sharper towards the end of the 20th century.

Figure 4-4 : %Cigarette smokers by social class



Overall these provide clear evidence of social trends in Britain which had non-manual men taking up smoking earliest, but then dropping it earliest. Non-manual women both started first and then dropped it first. This is consistent with social trends mediated by social class, with the non-manual groups started a trend which is then followed after a time lag by the non-manual groups. The pattern is consistent with what happened in the rest of Europe (at a later date). What this means for the cohort is that one would expect social class differences in men's smoking from the start, but social class differences in women's smoking to emerge later. Ideally these should be independent of all other factors that might affect smoking such as education and social circumstances.

4.6 Measures

Measures used for explanatory categories are described in general in chapter 3 and in detail in Appendix A. In keeping with the hypothesis (§3.6.6) they are considered in four categories; education, social circumstances, image and background.

4.7 Missing Data

Missing data is discussed in chapter 3.6.4. In the adjusted analyses presented below for comparisons of ever-smokers and never-smokers the data has almost exactly the same social composition as the original sample, though it contains about half the NSHD members. When ever-smokers are considered alone in adjusted analysis they usually have slightly more from the manual groups than the original sample, but that was also the case when ever-smokers were first identified at age 20 in 1966, so it probably reflects a difference in the ever-smoking group

4.8 Results

4.8.1 Who were the smokers?

Table 4.1 shows smoking habits at age 20. As expected in line with contemporary trends more men were smoking than women and the men were smoking more heavily. For the women 50% were current smokers. For the men 61% were current smokers. The figures are comparable with contemporary British data, which was 64% of men aged 16-24 smoking manufactured cigarettes in 1961 and 56% in 1973, while the figures for women are 49% in 1961 and 52% in 1973 (Todd, 1975).

Table 4-1: Smoking habits of the NSHD members at age 20 in 1966, weighted to allow for the original stratification.

	Women	Men
% Ever-smokers	54%	67%
% Current smokers at 20	50%	61%
% Of current smokers at 20 who smoked		
0-9 per day	45%	22%
10-19 per day	45%	53%
20 or more per day	9%	25%

4.8.1.1 Unadjusted relationships to smoking

Table 4.2 shows the relevance of the measures representing the four categories (education, social circumstances, image and background) to being a never smoker by age 20. The study member's current circumstances at age 20 in terms of employment, marital status, social class, place of residence etc, were not considered. These are not relevant, as most smokers have started by their late teens (Todd, 1959). Also at 20, people are just finding their feet and what are they doing at that time may be quite transient. For women aged 20 in 1966 social class is difficult to interpret, most were not married, so cannot be categorized according to their husbands social class and their own social class is difficult to interpret because of women's relatively lowly position and aspirations in employment at that time.

4.8.1.1.1 Women smokers

For women education and image relate to taking up smoking in the expected direction, in that more education, and greater conformity, less sociability, more feminine identity and weakly religiosity are associated with never smoking. Social circumstances are not consistently related to smoking as expected. There is no relationship between parental material circumstances and smoking. Some aspects of social support, such as parental divorce, are related to smoking as expected, while others are not. Going to clubs is associated with smoking initiation, rather than the reverse, which was expected. Depression was expected to be associated with smoking, rather than the reverse. Background is only very weakly related to smoking. This is consistent with historic trends at that time in Britain for women smoking being in transition from non-manual women having higher rates to manual women having higher rates.

4.8.1.1.2 Men smokers

For men education, social circumstances, image and background are related to starting to smoke in the expected directions. More education is associated with less smoking. Better parental material circumstances are weakly associated with less smoking. Parental divorce is associated with smoking. However as for women child onset depression is weakly associated with not smoking. The conformity aspect of image and weakly the femininity and religiosity aspects of image are associated with not smoking. Men with non-manual fathers or better-educated mothers were less likely to start smoking. This is in line with the long-term trends, which were beginning to show less smoking among non-manual men in the 1960s.

Table 4-2: Childhood/Adolescent measures and ever-smoking status at age 20 – unadjusted

		WOMEN never smoker	current or ex-smoker	N		MEN Never Smoker	current or ex-smoker	N	
Education									
Cognitive potential above av.	Yes	50%	50%	1036		38%	62%	1058	
	no	43%	57%	786	P< 005	31%	69%	764	P< 005
Left school at 16, or 16+	No	41%	59%	1078		30%	70%	1139	
	yes	55%	45%	877	P < 000	42%	58%	966	P < 000
Parents interested in primary school	No	44%	56%	819		32%	68%	960	
	yes	50%	50%	936	P< 005	38%	62%	926	P< 05
Social Circumstances									
Material circumstances									
Parents own home @ 4	Yes	46%	54%	515		36%	64%	550	
	no	48%	52%	1378	Ns	35%	65%	1470	Ns
Parents own home @ 15	Yes	48%	52%	722		38%	62%	769	
	no	47%	53%	1055	Ns	34%	66%	1147	P<.1
Social Support									
Parental divorce	Yes	**38%**	**62%**	**145**		**22%**	**78%**	**167**	
	No	**48%**	**52%**	**1818**	**P<.05**	**37%**	**63%**	**1955**	**P<.000**
Parents alive and well	No	**42%**	**58%**	**285**		30%	70%	307	
	Yes	**48%**	**52%**	**1481**	**P<.05**	37%	64%	1609	P<.1
Interests with parents	Yes	48%	52%	1403		36%	64%	1313	
	No	44%	56%	368	Ns	34%	66%	593	Ns
Interests with peers	Yes	46%	54%	1482	P<.1	35%	65%	1658	ns
	No	52%	48%	288		36%	64%	247	
Goes to clubs at 13	Yes	48%	52%	1080		35%	65%	1145	
	No	46%	54%	691	Ns	36%	64%	760	ns
Goes to clubs at 15	Yes	**44%**	**56%**	**1173**		35%	65%	1277	
	No	**53%**	**47%**	**557**	**P < .005**	36%	64%	595	ns
Stress									
Childhood anxiety depression	Yes	**56%**	**44%**	**156**		41%	59%	113	
	No	**46%**	**54%**	**1237**	**P<.05**	34%	66%	1485	P<.2
Image									
Conformity									
Conforms at 13	Yes	**51%**	**49%**	**1383**		**39%**	**61%**	**1376**	
	No	**35%**	**65%**	**360**	**P < .000**	**26%**	**74%**	**495**	**P < .000**
Conforms at 15	Yes	**51%**	**49%**	**1307**		**41%**	**59%**	**1321**	
	No	**34%**	**66%**	**430**	**P < .000**	**23%**	**77%**	**547**	**P < .000**
Works badly at school at 13	No	**48%**	**52%**	**1641**		**37%**	**63%**	**1681**	
	yes	**30%**	**70%**	**117**	**P<.000**	**25%**	**75%**	**203**	**P<.001**
Works badly at school at 15	No	**48%**	**52%**	**1610**		**38%**	**62%**	**1650**	
	yes	**31%**	**69%**	**134**	**P<.000**	**19%**	**81%**	**231**	**P<.000**
Sociability									
Very popular at 13	Yes	41%	59%	218		37%	63%	283	
	no	48%	52%	1557	P < . 1	35%	65%	1615	Ns
Makes friends very easily at 13	Yes	**39%**	**61%**	**283**		35%	65%	303	
	no	**49%**	**51%**	**1479**	**P<.005**	36%	64%	1575	Ns
Makes friends very easily at 15	Yes	**35%**	**65%**	**302**		32%	68%	303	
	no	**49%**	**51%**	**1426**	**P<.000**	36%	64%	1563	P< 2
Gender-Identity									
Exhibits feminine behaviour at 13	Yes	**53%**	**46%**	**552**		**39%**	**61%**	**500**	
	no	**44%**	**56%**	**1128**	**P<.001**	**34%**	**66%**	**1357**	**P<.05**
Exhibits feminine behaviour at 15	Yes	49%	50%	605		37%	63%	519	
	no	45%	55%	1075	P< 1	34%	66%	1334	Ns
Religiosity									
Religious upbringing	yes	49%	51%	1228		37%	63%	1151	
	no	43%	57%	300	P<.1	32%	68%	369	P< 1
Goes to Sunday school at 11	Yes	47%	53%	1530		36%	64%	1475	
	No	45%	53%	287	Ns	32%	68%	461	P< 2
Background									
Father non-manual at 4	Yes	50%	50%	761		**39%**	**61%**	**820**	
	no	46%	54%	1089	P<.2	**33%**	**67%**	**1156**	**P < .01**
Father non-manual at 15	Yes	49%	51%	713		**42%**	**58%**	**795**	
	no	46%	54%	928	ns	**31%**	**69%**	**954**	**P< .000**
Mother went to secondary school	yes	49%	51%	637		**39%**	**61%**	**735**	
	no	47%	53%	1164	ns	**34%**	**66%**	**1192**	**p < .05**
Father went to secondary school	yes	49%	51%	731		**39%**	**61%**	**828**	
	no	47%	53%	1060	ns	**33%**	**67%**	**1074**	**P< .005**

4.8.1.2 Adjusted analysis

A stepwise model selection procedure was used to determine how much influence each of these measures might have on taking up smoking, when considered together, as described earlier (§3.6 6). Table 4.3 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with smoking status for women and men.

4.8.1.2.1 Women Ever-Smokers

In a multiple regression model education and aspects of image are related to women starting smoking as expected. Women smokers have less education. Women smokers are less conformist, more social and less feminine. Social circumstances are not related to smoking as expected. Smokers are more likely to go to clubs. It is possible that going to clubs is another measure of sociability, but in the initial factor analysis to determine categories going to clubs came out on a different dimension from sociability Also going to clubs is significant in addition to another measure of sociability. It could represent more exposure to peer pressure at a time when the majority was smoking.

There is an inter-action between friendliness and conformity at 15. Looking at them as a combined factor (2x2) indicated they do not have a cumulative effect. Women who were friendly or rebellious or both friendly and rebellious were more likely to smoke than women who were less friendly and conformist, but those who were both friendly and rebellious were no more likely to smoke than those who were either rebellious or friendly alone.

Sensitivity analysis was carried out to check if weighting for the sample stratification had any effect on the odds ratios, or if any other measures not considered because they were not significant could be relevant, or if there were any alternative formulations of the model. Weighting the sample did not have much effect on the odds ratios Two other measures of image just failed to be significant in the expected direction: popularity at 13 and not having had a religious upbringing were almost significant for smoking. Allowing for parental education or parental home ownership at age 4 suggested these could be relevant as being associated with smoking. Parental home ownership at 4 was significantly associated with starting to smoke independent of all the other measures This could be a reflection of older historic trends where higher SES women had started smoking earlier in 20th century Britain

Table 4-3 : Odds ratios and confidence intervals for measures significantly associated with being an ever-smoker by age 20 in 1966

			Women		Men	
Category	**Measure**		**OR**	**95% CI**	**OR**	**95% CI**
Education	Stays at school till 16	Yes	1		1	
		no	1 6***	1.31-2 03	1 3*	1 03-1.66
Social circumstances	Parental divorce	Yes			1 8*	1 07-3.17
		No			1	
	Goes to clubs at age 15	Yes	1 5**	1.18-1 85		
		no	1			
Image - Conformity	Conforms at 13	Yes	1		1	
		No	1 5*	1 10-1 96	1 4*	1 05-1 82
	Conforms at 15	Yes	1		1	
		No	1 6**	1.18-2 03	1 7***	1.29-2.26
	Works hard at school at 13	yes	1		1	
		No	1.9*	1.17-3.18		
	Works hard at school at 15	yes			1.7*	1 10-2.50
		No			1	
Image - Sociability	Makes friends very easily at 15	yes	1.9***	1.39-2 49		
		no	1			
Image – Gender-identity	Exhibits feminine behaviour at 13	Yes	1		1	
		No	1.5*	1.18-1 85	1.3*	1.02-1.68
Background	Father non-manual at age 15	yes			1	
		no			1 3*	1 06-1.70
N			1501		1513	
Chi squared			117 6		91.6	
Df			7		7	
Nagelkerke r square			101		081	

* P < .05, ** P < .005, *** P < .0005

4 8.1.2.2 Men Ever-Smokers

In a multiple regression model education, social circumstances, some aspects of image and background are related to men's smoking initiation in the expected directions. Less education, parental divorce, lack of conformity, masculinity and manual family of origin are associated with men being more likely to be ever smokers. There is an inter-action between leaving school by age 16 and masculinity; only men who left school before 16 and showed masculinity were more likely to smoke.

Sensitivity analysis was carried out to check if weighting for the sample stratification had any effect on the odds ratios, or if any other measures not considered because they were not significant could be relevant, or if there were any alternative formulations of the model. Weighting the sample did not have much effect on the odds ratios. Parental home ownership at 4 was also independently and significantly associated with smoking. It was not initially considered, as it does not have a significant unadjusted relationship. It could

be a measure of those having more money and thus easier access to cigarettes. Not having child-onset depression was in some models significantly associated with starting to smoke. However this measure reduces the sample size and re-uses some of the measures used to represent education and image, so it was discarded on the basis that child onset depression was not relevant to starting smoking and it would be preferable to test the hypothesis without using an additional measure whose definition is not independent of the others.

4.8.1.2.3 Men v Women Smoking

Comparing men and women education, conformity and gender-identity are operating in a similar way, but social circumstances, sociability and background could potentially be operating differently for men and women. To check if some measures were operating differently for men and women a combined model was created using all the significant measures in the multiple regression models for men and women (as shown in Table 4.3) and sex, and used to identify any interactions with sex. This combined model indicated that sociability and background are operating differently (as they did show interactions with sex), but going to clubs and parental divorce may not be as these were significant in a combined model and did not interact with sex. This combined model also indicated that boys were significantly more likely to start smoking than girls. This is in line with contemporary historic trends, and probably not due to any innate quality of either sex.

The result for parental divorce could be due to lack of power. Parental divorce was relatively rare for the NSHD, so a stronger relationship is needed to show any effect. Estimating (using PASS (\$3.6.5)) the minimum effect size that could be detected for parental divorce for women in this sample indicated it is an odds ratio of 1.8. So it is possible that parental divorce is relevant for women, but does not have a strong enough relationship to show in this sample.

4.8.2 Ex-smokers by 36

4.8.2.1 Unadjusted relationships

4.8.2.1.1 Childhood and adolescence measures

Table 4.4 shows how measures representing the four categories relate to giving up smoking by age 36 in 1982. For women, measures of childhood education, parental material circumstances, conformity, sociability and weakly religiosity, and background are all related to giving up smoking. These are in the expected direction, i.e. the more educated, those from home-owning families, the more conformist, less social and possibly more religious are all more likely to give up than others. Background is now associated with women giving up smoking between 1966 and 1982. This is consistent with the historical trends changing in this period Britain (Figure 4.4 previous). For men measures of childhood education, parental material circumstances, parental divorce, conformity and background are related to giving up in the expected direction. For both sexes femininity and religiosity are not related to giving up as expected.

Table 4-4 : Childhood/Adolescent measures and ex-smoking status at age 36 - unadjusted

		WOMEN				MEN			
		Ex-smoker	smoker	N		Ex-smoker	smoker	N	
Education									
Cognitive potential above av	Yes	42%	58%	445		52%	48%	513	
	no	33%	67%	380	P<.01	42%	58%	454	P<.005
Left school at 16, or 16+	No	29%	71%	530		42%	58%	616	
	yes	53%	47%	351	P < .000	60%	40%	437	P < .000
Parents interested in primary school	No	33%	57%	391		41%	59%	505	
	yes	46%	54%	393	P<.000	53%	47%	448	P<.000
Social Circumstances									
Material circumstances									
Parents own home @ 4	Yes	51%	49%	243		55%	45%	263	
	no	33%	67%	619	P < .000	44%	56%	754	P < .005
Parents own home @ 15	Yes	50%	50%	326		54%	46%	369	
	no	31%	69%	471	P < .000	44%	56%	586	P < .005
Social Support									
Parental divorce	Yes	35%	65%	83		39%	61%	102	
	No	38%	62%	818	Ns	48%	52%	971	P< .2
Parents alive and well	No	34%	66%	143		45%	55%	163	
	Yes	39%	61%	655	NS	48%	51%	788	NS
Interests with parents	Yes	40%	60%	637		48%	52%	666	
	No	37%	63%	163	Ns	44%	56%	296	ns
Interests with peers	Yes	39%	61%	687		48%	52%	840	
	No	37%	63%	112	Ns	44%	56%	121	P<.2
Goes to clubs at 13	Yes	40%	60%	508		49%	51%	583	
	No	36%	64%	292	P < 2	44%	56%	379	P< 2
Goes to clubs at 15	Yes	39%	61%	559		48%	52%	662	
	No	38%	62%	221	ns	47%	53%	279	Ns
Stress									
Childhood anxiety depression	Yes	29%	71%	61		45%	55%	49	
	No	39%	61%	567	P<.2	47%	53%	767	ns
Image									
Conformity									
Conforms at 13	Yes	42%	58%	572		49%	51%	646	
	No	31%	69%	213	P <.005	43%	57%	298	P < .1
Conforms at 15	Yes	42%	58%	551		51%	49%	624	
	No	29%	71%	232	P < .001	38%	62%	316	P < .000
Works badly at school at 13	No	40%	60%	721		47%	53%	832	
	yes	28%	72%	75	P<.05	46%	54%	118	Ns
Works badly at school at 15	No	40%	60%	707		49%	51%	799	
	yes	23%	77%	77	P<.005	34%	66%	145	P<.001
Sociability									
Very popular at 13	Yes	41%	59%	109		51%	49%	139	
	no	39%	61%	693	ns	47%	53%	820	Ns
Makes friends very easily at 13	Yes	44%	56%	138		46%	54%	165	
	no	38%	62%	660	ns	47%	53%	781	Ns
Makes friends very easily at 15	Yes	31%	69%	160		49%	51%	165	
	no	41%	59%	618	P<.05	34%	66%	773	P<.1
Gender-Identity									
Exhibits feminine behaviour at 13	Yes	41%	59%	219		47%	53%	220	
	No	38%	62%	541	Ns	47%	53%	718	Ns
Exhibits feminine behaviour at 15	Yes	36%	64%	256		48%	52%	256	
	No	40%	60%	510	Ns	47%	53%	674	Ns
Religiosity									
Religious upbringing	Yes	40%	60%	702		47%	53%	794	
	No	33%	67%	199	P< 2	48%	52%	278	ns
Goes to Sunday school at 11	Yes	40%	60%	689		47%	53%	740	
	No	35%	65%	127	ns	48%	52%	242	Ns
Background									
Father non-manual at 4	Yes	49%	51%	332		54%	46%	386	
	No	32%	68%	499	P < .000	43%	57%	604	P < .001
Father non-manual at 15	Yes	50%	50%	313		54%	46%	359	
	No	33%	67%	421	P < .000	44%	55%	506	P < .005
Mother went to secondary school	Yes	47%	53%	289		53%	47%	358	
	No	34%	66%	519	P < .000	42%	58%	606	P < .000
Father went to secondary school	Yes	43%	57%	334		52%	48%	400	
	No	34%	66%	468	P < .05	43%	57%	554	P < .01

4.8.2.1.2 Adult Measures

Table 4-5: Adult measures and ex-smoking status at age 36 - unadjusted

		WOMEN				MEN			
		Ex smoker	Smoker	N		Ex-smoker	Smoker	N	
Education									
Has O levels or more	No	34%	66%	666		42%	68%	671	
	yes	52%	48%	201	P<.000	59%	41%	355	P <.000
Spouse with qualifications	Yes	45%	55%	394		57%	43%	401	
	No	32%	68%	447	P<.000	40%	60%	636	P<.000
Spouse left school at 16, or 16+	Yes	53%	47%	337		55%	45%	503	
	No	30%	70%	538	P<.000	40%	60%	548	P<.000
Social circumstances									
Material circumstances									
Owns own home	Yes	45%	55%	633		53%	47%	768	
	No	21%	79%	268	P < .000	33%	67%	302	P < .000
Low income or none (own)	Yes	40%	69%	548		40%	60%	540	
	No	33%	67%	290	P< 1	54%	46%	476	p < .000
Adequate Income	Yes	40%	60%	694		51%	49%	802	
	No	33%	67%	193	P< 2	36%	64%	262	P<.000
Go without - lack of money	Yes	30%	70%	171		39%	61%	190	
	No	40%	60%	723	P<.05	49%	51%	873	P<.05
Social Support									
Married	Yes	40%	60%	766		50%	50%	883	
	No	25%	75%	135	P < .001	32%	68%	190	P < .000
Children at home	No	34%	66%	118		37%	63%	280	
	Yes	39%	61%	783	ns	50%	50%	793	P < .000
Member of clubs, etc	No	35%	65%	494		42%	58%	454	
	Yes	42%	58%	407	P<.1	51%	49%	617	P<.005
Employed or housewife	Yes	39%	61%	821		48%	52%	1002	
	No	34%	66%	80	ns	31%	69%	71	P < .01
Stress									
Depressive symptoms	No	40%	60%	797		48%	52%	1023	
	Yes	24%	76%	102	P<.001	29%	71%	45	P<.05
Smoked <10 per day at 20	No	25%	75%	336		43%	57%	615	
	Yes	57%	43%	350	P<.000	66%	34%	200	P < .000
Image									
Sociability									
Friends round weekly or more	Yes	31%	69%	363		45%	55%	318	
	No	43%	57%	531	P<.000	48%	52%	745	ns
Gender-Identity									
In male dominated occupation	yes	40%	60%	87		47%	53%	907	
	No	38%	62%	807	Ns	47%	53%	159	ns
Religiosity									
Takes part in religious activities	Yes	53%	47%	233		64%	36%	161	
	no	33%	67%	664	P <.000	44%	56%	912	P <.000
Has religious belief	yes	40%	60%	585		47%	53%	575	
	no	35%	65%	291	P< 2	46%	54%	478	Ns
Background									
Social class non-manual	Yes	44%	56%	426		57%	43%	535	
	No	33%	67%	469	P<.001	37%	63%	523	P<.000

Table 4 5 shows how adult measures representing the four categories relate to giving up smoking by age 36. For both sexes, currently being in a more educated environment, living in better material circumstances with more social support, not being depressed, being less social, more religious and currently having a non-manual social class are all associated with having given up smoking, as expected. Depression is now associated with smoking in the expected direction, in that both child onset depression (weakly) and depressive symptoms at 36 are associated with being less likely to give-up More aspects of material circumstances and life outside the home are significant for men than women giving-up. Home ownership, higher income, adequate income, not having to go without, employment and membership of clubs and

associations are all associated with men giving-up. However for women only home-ownership and not going without are associated with giving-up at the 5% level of significance.

Having been a heavier smoker at 20 is also included in Table 4.5, defined as smoking 10 or more cigarettes per day at age 20. Smoking is addictive and heavier smoking is known to make it more difficult to quit (Lundberg et al, 1991), (Nordstrom et al, 2000). As would be expected smoking more at 20 is strongly associated with still being a smoker at 36.

Generally the adulthood measures present a similar relationship to giving up as the childhood ones did. The gender aspect of image still does not feature, but the adult measure of religiosity is strongly significant. This difference in the effect of religiosity according to childhood and adult measures could be because of the different definitions, rather than an actual difference. Far more NSHD members went to Sunday school at age 11, than went to church at age 36. Attending religious services may be a better measure of religiosity than Sunday School attendance.

4.8.2.2 Adjusted analysis – ex-smokers (by age 36)

A stepwise model selection procedure was used to determine how much influence each of these measures might have on giving up smoking, when considered together. Model building for smoking cessation was tackled in three stages in order to see how effects built up over time and to allow for the possibility that addiction (represented by level of smoking) is a key factor which negates the effect of others. The first model (labeled Child only) shows the childhood and adolescent factors associated with giving up smoking. The second model (labeled Child + Adult) shows the childhood, adolescent and adult measures associated with giving up smoking. The third model (labeled Child + Adult + Addiction) shows the childhood, adolescent and adult measures associated with giving up smoking when a measure of addiction is included.

4.8.2.2.1 Women ex-smokers (by age 36)

Table 4.6 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with women giving up, for each of the three models. In a multiple regression model for women the childhood categories associated with giving up smoking are education, an aspect of parental social circumstances and some aspects of image. According to childhood measures ex-smokers have more education, home-owning parents, and are more conformist and less social. Adding in adulthood measures retains all these categories and brings in religiosity and depression in the expected directions. Current social class is not significant and does not affect the estimates of the odds ratios for the other measures. Using adulthood and childhood measures ex-smokers have more educated spouses, own their own homes, are not depressed, are more conformist, less social and more religious.

Adding in addiction attenuates the effect of conformity, and the effect of some of the childhood measures of social circumstances and image, so they are no longer significant. Current social class is still not relevant. Addiction at 20 is strongly associated with not giving up smoking. Addiction interacts with sociability at 36, so that women who are less sociable at 36 and less addicted at 20 have slightly more chance of giving up than would be expected from the odds ratios for each measure.

Interactions within the image category are consistent in both models without addiction. It is necessary to be both conformist and less sociable to give up; either being conformist or less sociable on its own is not enough

The way adulthood measures of the same categories replace childhood measures provides some re-assuring consistency. The childhood model shows that education, better material circumstances, conformity, and less sociability measured in adolescence are related to giving up smoking over the next 20 years The adulthood model shows these same attributes measured at age 36 are related to having given up smoking by age 36, as is contemporary religiosity, possibly because of the quality of the childhood measures.

Table 4-6 : Odds ratios and confidence intervals for measures significantly associated with women giving-up smoking by age 36, using three different models.

		Model					
		Child only		Child + adult		Child + Adult + addiction	
		OR	95% CI	OR	95% CI	OR	95% CI
Education							
Left school at 16, or 16+	Yes	1 9**	(1 39-2 69)				
	no	1					
Spouse left school at 16, or 16+	Yes			2 0***	(1 39-2 80)	2 0***	(1.41-2 92)
	no			1		1	
Social Circumstances							
Owns own home at 15	Yes	1.8**	(1.29-2.50)	1.6*	1.15-2-29		
	No	1		1			
Owns own home at 36	Yes			2.0**	(1.34-2 99)	2.4***	(1 55-3 68)
	No			1		1	
Depressive symptoms	No			2.0*	1.12-3 44	1 9*	(1.04-3.42)
	Yes			1		1	
Smoked < 10 per day at 20	Yes					3.3***	(2 29-4 62)
	no					1	
Image							
Conformity							
Conforms at 15	Yes	1 6*	(1.11-2.25)	1.6*	(1.11-2 34)		
	No	1		1			
Sociability							
Makes friends very easily at 15	No	1 6*	(1 07-2 38)	1 6*	1.06-2 46		
	yes	1		1			
Friends round weekly or more at 36	No			1 7**	(1 22-2.39)	1 6*	(1 15-2 37)
	Yes			1		1	
Religiosity							
Takes part in religious activities at 36	Yes			1 7*	(1 16-2 42)	1 9**	(1 28-2 79)
	No			1		1	
N		739		707		655	
Chi squared		57.1		106 8		138 8	
Df		4		8		7	
Nagelkerke r square		.101		.190		257	

* P < .05, ** P < 005, *** P < 0005

Sensitivity analysis was carried out to check if weighting for the sample stratification had any effect on the odds ratios, or if any other measures not considered because they were not significant could be relevant, or if there were any alternative formulations of the model. Weighting the sample did not have much effect on the odds ratios. In both the childhood and adulthood model without addiction parental social class and paternal education both just fail to be significant; neither is significant on its own, and they are going in opposite directions. Paternal non-manual social class was associated with giving up and parental education was associated with not giving up. In the adult model including addiction, additional checking revealed that an alternative model has paternal manual social class as an alternative to depression.

Given the role of addiction in staying a smoker and the way allowing for addiction leads to rebelliousness becoming non-significant, addiction was investigated by modeling what is related to addiction at age 20, as shown in Table 4.7. Addiction was defined as smoking more than 10 cigarettes per day at age 20. In a multiple regression model for women education, parental home ownership, conformity and religiosity are associated with being more likely to smoke less than 10 a day. This explains why conformity and home ownership at 15 disappear when addiction is included, because there is a pathway consisting of conformity leading to lighter smoking which makes it easier to give up.

Table 4-7: Odds ratios and confidence intervals for measures significantly associated with women smoking heavily at age 20.

			Odds ratio	Confidence interval
Education	Left school at 16, or 16+	Yes	1.7*	(1.16-2.38)
		no	1	
Social Circumstances	Owns own home at 15	Yes	1.6*	(1 15-2 37)
		No	1	
Image – conformity	Conforms at 15	Yes	2 1***	(1 42-2 99)
		No	1	
Image - religiosity	Religious upbringing	Yes	1.5*	(1.00-2.29)
		No	1	
N			600	
Chi squared			48 9	
Df			4	
Nagelkerke r square			104	

* P < .05, ** P < .005, *** P < 0005

4.8.2.2.2 Men ex-smokers (by age 36)

Table 4 8 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with men giving up As for women there are three models, childhood measures only, childhood and adolescent, and finally including a measure of addiction.

The childhood categories associated with men giving up smoking are education and the conforming aspect of image Adding in adult measures brings in better current social circumstances (both home ownership and social support), the religiosity aspect of image and background (current non-manual social class) as associated with giving up. Allowing for addiction leaves the overall pattern unchanged, though the effect

of social support is attenuated so that it is not significant. In all three models childhood background is not significant and does not affect the other measures' estimates or significance much.

Sensitivity analysis indicated that some sociability, depression and poverty (not having enough income to manage) all came close to being significantly associated with continuing to smoke. Weighting to allow for the original sample stratification has little effect on the odds ratios.

Table 4-8: Odds ratios and confidence intervals for measures significantly associated with men giving-up smoking by age 36, using three different models.

		Model					
		Child only		Child + Adult		Adult + Addiction	
		OR	95% CI	OR	95% CI	OR	95% CI
Education							
Left school at 16, or 16+	Yes	1.8***	(1.36-2.34)				
	no	1					
Spouse with qualifications at 36	Yes			1.8***	1.34-2.42	1.5*	1.10-2.15
	No			1			
Social circumstances							
Owns own home at 36	Yes			1.5*	1.07-2.08	1.5*	1.06-2.29
	No			1		1	
Member of clubs, etc at 36	Yes			1.4*	1.02-1.79		
	No			1			
Smoked <10 per day at 20	No					2 5***	1.70-3.66
	yes					1	
Image							
Conformity							
Conforms at 15	Yes	1 5**	(1.17-2.06)	1.5**	1.14-2 06	1.6*	1.15-2.81
	No	1		1		1	
Religiosity							
Takes part in religious activities 36	Yes			1.8***	1.21-2.76	1 7*	1.08-2.71
	No			1		1	
Background							
non-manual social class at 36	yes			1.6**	1.18-2 13	1 6**	1.17-2.29
	no			1		1	
N		940		902		697	
Chi squared		33.9		89 4		87.7	
Df		2		6		6	
Nagelkerke r square		047		.126		158	

* P < .05, ** P < .005, *** P < .0005

4.8.2.2.3 Men v women ex-smokers (by age 36)

Comparing the main model (childhood factors, adulthood factors, no addiction) for men and women education, material social circumstances, conformity and religiosity are operating in a similar way, but the

social support and depression aspects of social circumstances sociability and background could potentially be operating differently. Using a combined model and looking for interactions with sex indicated that background is operating differently (as it interacts with sex), but depression and sociability may not be. Depression and sociability are significant for both sexes in a model without addiction, and do not interact with sex. This is explicable for depression and sociability as they both came close to being significant for men as well as women and are significant in a combined model. While the social support aspect of social circumstances is not significant in a combined model and does not inter-act with sex, so its presence is not that reliable. In a combined model sex itself is significant, with men being more likely to give-up than women.

The result for depression could be due to lack of power. Few men reported depressive symptoms, so a stronger relationship is needed to show any effect. Estimating using PASS ($3.6.5)) the minimum effect size that could be reliably detected for depressive symptoms for men in this sample indicated it is an odds ratio of 2.6. So it is possible that depression is relevant for men, but does not have a strong enough relationship to show in this sample.

4.8.3 Ex-smokers between 36 and 43

Overall these models looking at the broad sweep of smoking for one group over 20 years give a broader picture of smoking than usually found, with the role of image, and enables a distinction to be made between all aspects of socio-economic status. Social class is more important factor for men giving up smoking than women in Britain between 1960 and 1982, but if historic trends play a role then social class should become more important for women. Given this an attempt was made to identify any areas of differential change using the smoking data available for 1989. Comparing ex-smokers at 43 with smokers allowing for smoking status at 36 identifies any areas of differential change or any factors that are becoming more or less important over time or at this particular age. Allowing for smoking status in 1982 accounts for most of the variation in the data. Addiction appears to be independent of most of the other measures associated with giving up smoking and reduces the sample size, so it was not considered further. A stepwise model selection procedure was used to determine how much influence childhood and adulthood measures might have on giving up smoking, when considered together, excluding addiction. Only two models were built to describe change between 1982 and 1989, one for men and one for women. It was found that on the whole only measures relating to 1989 rather than 1982 were significant; the equivalent measure for social support was not included, so it is impossible to say whether contemporary social support is relevant.

4.8.3.1 Women

Table 4.9 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with women smokers becoming ex-smokers by age 43 allowing for smoking status at age 36. They are education, social support, (i e. being married), less money and having a non-manual background. Father's social class and current social class are shown together because they are not quite independent. Women from a manual background who are still manual are significantly less likely to give up than the others There are interactions, which suggest that those least likely to give up are either the unmarried, or the married who have a manual social class at 4 and 43 and are not too poor.

Non-manual social class is now related to women giving-up. It could be that social class has a greater effect at this age, or at this historical time. It also appears to indicate that for women at this stage financial constraints, when allowing for education and social class, are not themselves a barrier to giving-up, but could in fact act as a spur to giving-up.

Table 4-9: Odds ratios and confidence intervals for measures significantly associated with women giving-up smoking by age 43, allowing for smoking status at age 36.

Category	Measure		OR	CI
Education	Has O levels or more	Yes	1.9*	1.09-3.25
		no	1	
Social circumstances	Married at 43	Yes	2.3**	1.33-3.94
		No	1	
	Go without - lack of money and Low income at 36	Yes	1.9*	1.03-3.66
		No	1	
Background	Father non-manual at 4 and self non-manual at 43		2.4**	1.32-4.34
	Father non-manual at 4 and self manual at 43		2.1*	1.04-4.19
	Father manual at 4 and self non-manual at 43		2.3**	1.32-4.13
	Father manual at 4 and self manual at 43		1	
N	N		661	
Chi squared			33.4	
Df			6	

P < .05, ** P < .005, *** P < .0005

4.8.3.2 Men

Table 4.10 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with men giving up smoking by age 43 allowing for smoking status at 36. These are education, some aspects of social circumstances and an aspect of image. No measure of background was significant or affected the other measures, even when tried in combinations to reflect cumulative manual or non-manual experience. Staying on at school and spouse's education are shown together because each just failed to be significant, but their combined effect, i.e. staying at school and having a spouse with qualifications is. Home-ownership, adequate income and unemployment are associated with giving-up. Logically one would expect these to be related. Looking at all eight possible combinations of these measures indicated that compared with men in employment owning their own homes with adequate income, men who owned their homes but were not working were more likely to give-up, men who were not home owners were less likely to give up and men who owned their homes, were in employment but did not have an adequate income were less likely to give-up. This could be interpreted as men giving-up when they had the incentive to do so, but not giving-up when they were doing their best but finding it hard to cope. However the numbers involved in some of these groups are quite small.

Table 4-10 : Odds ratios and confidence intervals for measures significantly associated with men giving-up smoking by age 43, allowing for smoking status at age 36.

Category	Measure		OR	CI
Education	Left school at 16, or 16+ and had Spouse with)	Yes	1 8**	1 28-2 62
	qualifications at 36)	No	1	
Social circumstances	Owns own home at 43	Yes	2 2**	1 36-3 41
		no	1	
	Adequate Income at 43	Yes	2 0*	1 18-3 24
		no	1	
	Employed or housewife at 43	Yes	1	
		No	3.3**	1 56-7 08
Image - religiosity	Takes part in religious activities at 43	Yes	2 0*	1 08-3 60
		No	1	
N	N		893	
Chi squared			47 5	
Df			5	

P < .05, ** P < .005, *** P < .0005

Men and women are similar in that education is helpful for both sexes, while material advantage is helpful for men but not women and background is helpful for women but not men. In a combined model almost all the measures interacted by sex, suggesting these are valid differences between men and women.

4.9 Discussion

Having the unparalleled opportunity to investigate smoking over 30 years for one homogenous group, subject to broadly similar conditions with respect to agency and historical trends has made it possible to take a wider view on smoking and show that both smoking initiation and smoking cessation are related to the public image of smoking and historic trends as well as the usual educational, material and personal factors. This discussion largely concerns adjusted relationships, i.e. the relationship found when allowing for measures in the other three categories. However there are some caveats in this analysis which will be pointed out before going on to discuss the results. These caveats relate to the outcome definition, power and measurement error.

As explained previously (§4 4) the NSHD members did not all provide completely consistent information on their smoking habits. To check if the choice of definition could have affected the results, preliminary adjusted re-analysis with different definitions was carried out. This suggested that the precise definition did not make much difference to the overall pattern of results

As pointed out in the results there are a few cases where an effect may not be observed because of insufficient power rather than because it does not exist. This is most likely to happen if the event is quite rare in this sample, such as parental divorce. A stronger relationship is needed to detect an effect for a relatively rare event. In the multiple regression analysis of smoking initiation the samples are quite large, so there is sufficient power to detect smallish effects (odds ratios of about 1.6) as long as the event occurs

for more than about 10% of the sample. For men and women the measures which are significant in unadjusted analysis are, with the exception of parental divorce, common enough not to suffer from insufficient power Parental divorce was significant in the multiple regression model for men, and might be for women. So with the exception of parental divorce for women lack of power does not appear to be an issue. In the multiple regression analysis of giving-up smoking the samples are more medium sized, so the measures need to be more common, i.e. occur for about 20% of the sample, in order to have sufficient power to detect smallish effects. For women the significant measures which are at risk of insufficient power are inadequate income and depression For men they are inadequate income, unemployment, depression and taking part in religious activities. Most of these either did feature in an adjusted model or were represented in the model by another measure from the same category. The only exception is depression for men. So overall with these two exceptions there is no reason to think that inadequate power is an issue for this analysis.

Religiosity in adolescence was expected to be associated with less smoking initiation and more giving-up, however this effect was not observed, although the adult measure of religiosity is strongly related to having given-up. This difference from childhood could be due to the measures available. The relevant adulthood measure is active participation in religious activities (not personal beliefs). For childhood and adolescence a measure of the NSHD member's willing and active participation is not available The potential childhood measures are going to Sunday school which could be a working-class habit (McLeod, 1996), and not guaranteed to reflect the child's interest, particularly as for this cohort the vast majority did go, or thinking at 36 that they had a religious upbringing, which is a rather nebulous concept which most people agreed with and which undoubtedly represents a personal perception rather than action.

4.9.1 Education

For the NSHD education is consistently associated with less smoking, i.e. less initiation and more quitting, for both men and women independent of social circumstances and social class. The finding on smoking initiation is consistent with the research reviewed earlier (§4.5.1) which usually finds more education associated with less smoking initiation. However this finding regarding the effect of education on smoking initiation is more interesting because it relates to a period (early 1960s Britain) when smoking was still quite fashionable for women, and the effect is independent of social class. So it is clearly suggesting that education, for education's sake, rather than as a marker of something else, has an independent effect.

The finding that education is related to quitting is consistent with much of the research reviewed (§4.5.1). However there are some studies which do not find education associated with quitting There are many factors which could have contributed to this difference. Some of the previous studies are looking at change in prevalence rates (Bennett, 1995), (Pekkanen et al, 1995). The difficulty with studies of prevalence rates is that one does not know how that rate was arrived at, and it could just be a quirk of changing initiation and quit rates. Some of the previous studies did not consider social class as well (Bennett, 1995), so the finding could reflect social class trends, not education. Some of the previous studies were looking at a different time period in a different country when fashions may have been different. i.e. 1974 to 1981 in Sweden (Lundberg et al, 1991). Some considered who, out of samples of current smokers, went on to give up, (Lundberg et al, 1991) (Nordstrom et al, 2000), rather than comparing ever smokers and ex-smokers.

None of them considered the indirect effect of education coming from an educated spouse Overall it is consistent with other studies that this analysis has shown clearly in a representative sample of ever-smokers that giving up by age 43 is associated with education, when allowing for other facets of socio-economic status. It would be interesting to know if the educational level of other family members, such as children, had any effect. However the key issue is why differences by educational level are occurring. There are several possible explanations.

One interpretation of the effect of education is that those who feel they are failing smoke to compensate. However when the NSHD were growing up leaving school was a viable option with prospects and apprenticeships. There were relatively well-paid jobs available for young people, and unemployment with all the attendant schemes for young people was yet to come (Halsey, Webb 2000). This also does not explain why more boys chose to smoke than girls, nor is it consistent with the more socially successful girls smoking.

It is possible that education enables people to understand and act on health education messages more quickly. If this is the case it is the effect of education, either own education or living in a more educated environment, not the effect of cognitive potential, as if the training in thinking provided by the educational experience helps people to act on ideas and information. This is consistent with the views of some health psychologists, who see people as reluctant thinkers, with those most used to thinking being most willing to act on information (Fazio, 1990). In a way it is also consistent with how pre-school intervention programs in the US may enable the participants to do better in many aspects of life as well as education (Schweinhart et al, 1993).

It is possible that education is a marker for other skills, such as competence and resilience which give the individual greater capacity to manage themselves and possibly change. This is consistent with some evidence on smoking initiation being related to competence (Epstein et al, 2000), and continuing to smoke being related to adversity (Anda et al, 1999).

Another possible explanation is that education is simply a marker for social class and that it is social class mediating change. But this is not consistent with the evidence as for women differences by educational level are evident when there are no differences by social class, and for men there are differences by educational level and social class. Another possibility is that it is education rather than social status mediating following trends. From the data available on smoking it is difficult to say whether this is the case or not because both historic trends and health education were going in much the same direction throughout the period under study, so either explanation is a possibility. Yet another possibility is a rather more complex model of social change, mediated firstly by education and then later on by social class This is not inconsistent with the evidence. However it is not the only possible explanation that fits, there are the others mentioned above. Considering health behaviour at a time when the health education message is at odds with historic trends could help clarify this point.

4.9 2 Social Circumstances

Social circumstances did not have the expected relationship with smoking initiation, and did not consistently do so with quitting There was no relationship between measures of more advantageous parental circumstances and smoking initiation If anything there are indications that better parental material circumstances could be related to smoking initiation, though these are not very strong If parental circumstances are a marker for the teenager's access to money, then this is consistent with findings that cost can be a barrier to smoking ($4.5 2.1). But it is not consistent with findings that better parental material circumstances are related to less teenage smoking (Oakley et al, 1992), (Hu et al, 1998). It could be that material circumstances are a marker for socio-economic status, however when allowing for education and social class parental home ownership is associated with if anything more smoking, so it would have to be the effect of the earlier trend for those of higher socio-economic status to smoke more.

In adulthood better material circumstances are associated with quitting for both men and women independent of other measures of socio-economic status, i.e. education and social class. For men better material circumstances are associated with quitting by age 36 and between age 36 and 43. For quitting by age 36 it is home ownership which is important and for quitting between 36 and 43 it is home ownership and higher income which are important, suggesting that it really is greater wealth, not only choices about how that wealth is spent, which are important for men. This is consistent with other studies (Flint, Novotny, 1997). For women the relationship is less consistent; home ownership was associated with quitting by age 36, but between 36 and 43, quitting is associated with worse material status. These results are not completely consistent with the idea that women living in poverty with children are more likely to smoke (Graham, 1987), or with the finding that among women on income support those suffering multiple aspects of poverty were more likely to be smokers (Graham, Blackburn, 1998). This may be because these studies were considering prevalence rather than quitting, or it could be because this study only used broad measures of material deprivation at one point in time, or it could be that the measures representing lack of education and lower social class are also markers of material deprivation Finally results found could depend on the historical period. Women in the NSHD (born in 1946) might have been less likely to experience living on their own in poverty with children than women born later for whom single motherhood is more socially acceptable. These results are consistent with the finding that in a representative set of British women quitting was associated with cigarette consumption, pregnancy, school leaving age and own social class, but not tenure (Graham, Der, 1999). However considering these findings from the point of view of women's roles, they are consistent with women's duty to make sacrifices for their families (Graham, 1987). Given that it is home-ownership for women rather than income level which is significant it raises the question of what home ownership means. Is it a measure of wealth or a marker of much more than wealth; for example confidence in the future, planning abilities. Finally it is puzzling that material circumstances seem to matter more for men than for women, which would suggest that they are more important to men. Maybe women are deriving satisfaction from other sources, such as friends or family.

Turning to social support and depression, these childhood factors did not operate as expected, particularly for girls. For girls both potentially less social support from parents (possibly parental divorce) and greater social support for peers was associated with being more likely to smoke This is consistent with some other

studies (Lifrak et al, 1997). For boys less social support in the form of parental divorce was associated with teenage smoking initiation. Depression was not associated with smoking initiation. It is possible this is because the reasons for smoking were different at a time when more than half the teenagers smoked. However another longitudinal study also found no relationship between childhood depression and smoking once other factors were considered (McGee et al, 1998).

The relationship with adult factors was more as expected. Men with external social support were more likely to quit by age 36. Married women were more likely to quit between age 36 and 43. Depressed women were less likely to quit by age 36, and the same relationship for men might have been evident in a bigger sample. It is perhaps surprising that having children living at home was not significantly associated with quitting. Pregnant women have lower smoking rates (Owen et al, 1998), (Ebrahim et al, 2000), but many go back to smoking after the birth (Brenner, Mielck, 1993), possibly because they gave up for the baby rather than themselves.

As several other studies have shown addiction is a key factor in quitting (Nordstrom et al, 2000), (Graham, Der, 1999). Due to the comprehensive nature of this longitudinal data, it has also been possible to show that the amount smoked at an early stage in a smoker's career is important, and that on the whole addiction has an effect independent of the other factors associated with quitting.

4.9.3 Image

Generally image behaved as expected. For girls rebelliousness, sociability, lack of femininity, and almost, lack of religiosity were all associated with starting to smoke. For boys rebelliousness and lack of feminity were associated with starting to smoke. These are independent of education, social circumstances and social class. Others have found the associations between rebelliousness and sociability and smoking initiation as previously discussed. It is puzzling that sociability matters for girls starting but not boys. Sociability being more important for women could be because girls are more attuned to considerations of social acceptability, or it could be due to the higher prevalence rates for boys, i e. wherever boys went they were likely to be surrounded by smoking peers, while for girls it took more sociability to be surrounded by smoking peers. Others have not looked for the association between lack of feminity and smoking initiation. It is also possible that it might no longer be the case in societies where women smoke as much as men, though it could still be the case in societies where smoking is still dominated by men. The lack of a clear relationship between religiosity and smoking initiation may be due to the measure used.

Adolescent measures of conformity and lack of sociability and current measures of religiosity were associated with women quitting by age 36. Adolescent conformity and current religiosity were associated with men quitting by age 36 and between age 36 and age 43, lack of sociability came close to being associated with giving-up for men in adjusted analysis. The lack of association between feminine gender-identity and quitting may well be because the public image of smoking as a masculine activity had begun to change by the 1970s when the proportion of women smoking approached that of men (ONS, 2000). These results are not consistent with a study that found no association between the personality attribute of rebelliousness and quitting (Lipkus et al, 1994), but that study uses a different definition of rebelliousness and is based on college alumni rather than being representative There is little evidence from other sources

on conformity and sociability. However these results are in accord with the public image of smoking as reflecting rugged individuality (Goodman, 1993), being sociable and not associated with restraint.

4.9.4 Background

For men non-manual social class is associated with less smoking, i e. non-manual parental social class is associated with less smoking initiation and current non-manual social class is associated with having quit by age 36. For women smoking initiation in the early 1960s is not associated with parental social class or education level. This is consistent with social trends being in transition at that time as shown in Figure 4.4. Women quitting smoking by age 36 is not associated with non-manual social class. Background featuring for men but not women at this time is in line with the social trends previously described For women non-manual social class is associated with quitting smoking in 1980s, between age 36 and 43. This is consistent with women following trends later than men - i.e. for men to have started smoking sooner and started given it up sooner - and the general view of social change driven by status. 'This .. is an example of the sociological truth that new habits (such as smoking among women) introduce themselves in the younger age groups and in the upper social ranges first' (Hobson, Henry, 1948). It is consistent with mixed finding of differential change by social class previously discussed, because whether social class is relevant will depend on where smoking is in the fashion cycle. It is also consistent with recent studies finding women living in poverty more likely to smoke, assuming long-term non-manual social class is a marker for the same sort of deprivation.

5 DRINKING

5.1 Introduction

Drinking is thought to be a major factor in preventable mortality and illness, as a risk factor for cancer, stroke, accidents and suicide (McGinnis, Foege, 1993), (DoH, 1998). During the lifetime of the NSHD members attitudes and legislation on alcohol have become more liberal and there has been a doubling of alcohol consumption, despite public health advice to limit alcohol intake ($1). So, it is important to understand why this has happened

5.2 Hypothesis

The hypothesis is set out in chapter 3.6.1 and Figure 3.1.

5.3 Health Education Message

Social surveys in the 1950s saw drinking as an enjoyable leisure activity. For example, alcohol is considered in a chapter entitled 'Use of Leisure Time' not the 'Health' chapter (Carr-Saunders et al, 1958), while another considers drink in a chapter called 'For To-night We'll Merry Be' (Browne, 1950).

In health education concern started with 'problem' drinking. In 1970 the Scottish Home and Health Department's report on 'Health Education and Alcohol' was about alcoholism and heavy drinking (SHHD, 1970). Similarly a health education publication on alcohol in 1978 starts off in the foreword with 'There is little doubt that one of the most intransigent of all our current health problems, .., stems form the abuse and misuse of alcohol' (Caruana et al, 1978). In the 1970s alcohol was designated as one of the priorities for the Central Council on Health Education, and a campaign started in the North-East in 1974 (Linthwaite, 1987). However the contemporary government position in 1981was an equivocal balancing of interests, taking into account the popularity of drinking, taxation and the interests of the drinks industry. As illustrated by these quotes from 'Drinking Sensibly - 'Alcohol gives harmless pleasure to many, and most people drink sensibly', 'the primary purpose of duties on alcoholic drinks.. to raise revenue', 'The Government must also have regard to the economic importance of the drinks industry..' (DHSS, 1981). There also seems to have been a disinclination to provide clear advice 'A health education message that recommends safe limits might be counter productive' (DHSS, 1981). All in all it is hard to see this as clear advice on drinking, beyond surmising that sensible drinking is desirable, but not what it is.

Definite advice on the meaning of sensible or what was called 'low-risk' drinking emerged for the first time during the 1980s, and was backed up by publicity. The Health Education Council was aiming 'to promote the acceptability of light drinking or abstinence as norms' (HEC, 1982) In 1984 the Health Education Council produced 350,000 copies of 'That's the Limit' and there was a BBC television series of the same name (HEC, 1984). By the mid to late 1980s advice from the royal colleges were endorsing the HEC's lead and consolidating on the recommendation of 'sensible limits of drinking' or 'low-risk' drinking as not more than 21 units a week for men and not more than 14 units a week for women (HEC, 1985), (RCP, 1986), (RCGP, 1986). (RCPL, 1997). This message was re-iterated in the 'Health of the

Nation' targets (DoH, 1992), which aimed at reducing the proportion of men drinking more than 21 units a week and women drinking more than 14 units a week. However in late 1995 the government recommendation was changed to not more than 4 units a day for men and not more than 3 a day for women (DoH, 1995). None of the advice in the 1980s mentions moderate light drinking as recommended or binge drinking as particularly harmful, though the potential benefits of light drinking were considered in 1995, but rejected in a joint report by the royal colleges (RCP et al, 1995).

Public knowledge is hard to gauge. In the early 1980s it is likely that awareness of 'moderate' drinking as a health issue was low. For example a survey in 1977 asked people if they had done anything in the last 10 years to make themselves more or less healthy, and only 2% mentioned drinking less (Anderson, 1983). A survey in 1987 of people's knowledge of alcohol did not even ask if anyone knew what sensible limits might be (Smith et al, 1989). By 1989 some progress had been made and a survey revealed (Sandberg, 1990) that 5.4% of those asked knew the meaning of a unit and the sensible limit for men and 3.7% knew the meaning and the limit for women.

5.4 Outcome

In the light of contemporary public advice on alcohol consumption it would be anachronistic to consider anything other than 21 units for men and 14 units for women as 'low-risk' weekly limits corresponding to recommended healthy behavior in the later 1980s. It is arguable that these limits do not represent what is now seen as the optimal alcohol consumption level for health, because they do not reflect current concerns with binge drinking or the possibility that moderate drinking could be beneficial. However the aim of this thesis is to evaluate health behaviour in response to public health messages, so it only makes sense to consider behaviour in the context of the contemporary health message, not later knowledge and/or messages. Currently there is debate over whether any level of alcohol consumption is beneficial to younger age groups (under 55s) (Corrao et al, 2000), (Britton, McPherson, 2001). The current US guidelines say 'moderate consumption provides little, if any, health benefit for younger people' (Dufour, 2001).

A unit is commonly taken to be 8 grams of alcohol (RCP, 1991). Data on drinking habits over a week for the NSHD members is available in 1982 and 1989, in grams and this has been converted into units. Given there was some government efforts to change drinking habits in that period, the most useful outcomes to look at are: who was drinking over the limit in 1982, and who changed their drinking habits between 1982 and 1989, possibly in response to the public health message.

Self reported alcohol consumption is thought to be under-reporting because it is usually less than overall alcohol sales (Midanik, 1982). This could be due to the absence from these surveys of the small minority of alcoholics or general under-recording. For the NSHD alcohol consumption was recorded in diet diaries (2 days retrospective and 5 days prospective) in both 1982 and 1989. NSHD members were also asked more generally about their alcohol consumption in 1989. In the interests of consistency the same source for alcohol was used in 1982 and 1989, i.e. diet diaries. Most people who filled in diet diary provided the full week, the few with less than a week but more than two days were also included, multiplied up to a week. There is little information on whether some groups are more likely to under-report their alcohol consumption than others, and no obvious way of validating self-reports, as can be done for diet, comparing

basal metabolic rate to calories reported In reporting alcohol intake some NSHD members may have tried to give socially acceptable responses. One could speculate that these would be along the lines of under-reporting, possibly more so for women than men

5.5 Previous Research

Much of the literature on alcohol focuses on extremely high levels of alcohol consumption, alcoholism and problem drinking. There is no guarantee that these are mediated in the same way as 'low-risk' drinking. Health behaviour alcohol research can be tricky to interpret because there is no generally agreed way of measuring alcohol consumption, nor an agreed yardstick of 'unhealthy drinking'. Alcohol use is sometimes measured using quantity/frequency measures (which classifies people into drinking types according to the frequency and quantity of their drinking) and sometimes by counting units. In Britain the GHS surveys, available since 1978, changed from the quantity/frequency measure in 1986 to a unit measure. The definition of unhealthy drinking varies with place and time, so there is a risk that differences between one study and another are due to different defin tions. For example one recent study classified healthy drinking as between 1 and 2.5 units a day more than 5 times a week for men and women (Bartley et al, 1999). Alcohol use is strongly age related. From early adulthood alcohol consumption declines with age (Johnson et al, 1998); this can make comparisons difficult unless adjusted by age.

5.5.1 Education

Currently in adolescence less identification with school is associated with more drinking (Lifrak et al, 1997), (Karvonen, Rimpela, 1996). Abstaining is often associated with lower education for men and women (Caetano, Clark, 2000), (van Oers, 1999), (Greenfield et al, 2000). Excessive drinking is often associated with lower education in men (Caetano, Clark, 2000), but shows little relationship with education in women (Caetano, Clark, 2000), (van Oers, 1999). In some countries higher consumption (measured by average units) has been seen in more educated groups (Knibbe at al, 1985). Exactly how this relates to drinking more or less than the 'low-risk' level is not clear. The evidence on differential change is sparse.

5.5.2 Social Circumstances

5.5.2.1 Material Circumstances

Price is a barrier to drinking (Osterberg, 1995). Unemployment is associated with abstaining and excessive drinking (Lee et al, 1990). However becoming unemployed does not seem to consistently change drinking habits (Temple et at, 1991), (Hajema, Knibbe) although it has been associated with more drinking among specific groups, such as highly educated, single women during a recent recession in Finland (Luoto et al, 1998).

5.5.2.2 Social support

Theoretically supportive social relationships should protect against unhealthy behaviour. However alcohol consumption is part of many occasions when relationships might be built, especially for men For whatever reason there is little evidence on this point In the case of family, acquiring a spouse or becoming a parent is associated with drinking less (Hajema, Knibbe, 1998), (Miller-Tutzauer et al, 1991), (Horwitz, White,

1991), (Leonard, Rothbard, 1999) Conversely moving out of marriage is associated with drinking more (Temple et al, 1991), (Power et al, 1999).

However one aspect of social relationships, which may have more to do with the acquisition of skills and resilience in childhood, is that less effective parenting (marked by parental separation, or inconsistent punishment) is often associated with heavy drinking in adulthood (Hope et al, 1998), (Holmes, Robins, 1987), (Kuh, Maclean, 1990). However as this is a relationship which emerges in later life it may be more to do with skills deficits that become more obvious over time, and it may not be relevant to drinking at 'low-risk' levels.

5.5.2.3 Stress

Stress has for a long time been seen as a reason for drinking (Horton, 1943). However there is little evidence that people drink more in times of stress than they would otherwise do (Romelsjo et al, 1991), (Hammer, Vaglum, 1989), (Cooper et al, 1990), (Kubicka et al, 1998).

5.5 3 Image

Alcohol consumption is not only a matter of personal choice. It is hedged around with ceremonial roles, taboos, cultural traditions, secular trends and social controls (Vasey, 1990), (Douglas, 1987) (Robinson, 1976). It also varies greatly from culture to culture even in apparently objective fields. For example American research on alcohol and brain function concentrates on the hypothesis that alcohol damages the brain (Parker and Noble, 1977), (Nichols, Martin, 1996), (Hannon et al, 1987). (Hannon et al, 1983). European research is more interested in the proposition that alcohol enhances brain function (Dufouil et al, 1997), (Launer at al, 1996).

5.5.3.1 Conformity

For most of the last millennium government interest in alcohol has been within the framework of political acquiescence, work discipline and ensuring there was no breakdown in the social and political order (Dorn, 1983). Initially any interest in alcohol was to ensure a supply of food and drink at fair prices (Dorn, 1983). Then it moved on to public order, reflected in the way public gatherings at alehouses were regulated, and finally with the emergence of the industrial working class and the need for organized labour moved on to concerns about the maintenance of labour discipline (Barr, 1998). For example licensing laws were strengthened during the First World War with the aim of improving national efficiency. However, these controls have always been tempered by considerations of national economy; i.e. the value of the brewing industry, the value of alcohol taxes and the electoral aspects of any policy (DHSS, 1981).

One would expect the more conformist to be less likely to drink excessively. However there is little evidence on this point.

5.5 3.2 Sociability

It is easy to forget that drinking alcohol is enjoyable and a traditional way of relaxing and celebrating. There is the ritual use of alcohol at celebrations There is the time-honored use of alcohol for convivial relaxation, at social gatherings, in pubs and parties, coupled with strong prejudice against drinking alone.

A survey of young people in the late 1960s found the image of the non-drinker was not sociable (Davies, Stacey, 1973) An analysis of the portrayal of drinking on television in 1983 confirms the stereotype of drinking as social and celebratory (Hansen, 1986), but not solitary, whilst the Independent Broadcasting Code of Advertising Standards and Practice introduced in 1978 indicates the image alcohol might have, but which must not be promoted 'Advertisements may not imply that drinking is essential to social success.' (Pendelton et al, 1988).

In view of the sociable image of drinking, one would expect sociability to be associated with drinking more. There is little evidence on this point, but one study found increased drinking associated with expansion of social contacts (Kubicka et al, 1998).

5.5.3.3 Gender-identity

Historically men have been more likely to drink, more likely to drink regularly and have drunk more than women (Browne, 1950), (OPCS, 1996). An analysis of the portrayal of drinking on television in 1983 confirms the stereotype of women drinking less (Hansen, 1986). For men drinking is an accepted part of life, while for women it has had derogatory associations. A social survey in the 1940s felt it necessary to re-assure its readers 'Women can share the flowing bowl without being written off as hussies' (Browne, 1950). Surveys contemporary to the NSHD find girls more disapproving of drunkenness, in 1963 77% of boys and 89% of girls considered drunkenness to be wrong; in 1970 the corresponding figures were 53% of boys and 70% of girls (Caruna et al, 1978). A survey in 1972 asked if 'It's degrading for women to be seen drinking in public houses', and found 45% agreed (Dight, 1978). Psychoanalysts, psychiatrists, and psychologists investigated a relationship between deviant sexuality and alcoholism, i.e. alcoholic men are too feminine and alcoholic women are too masculine (Parker, 1969), (Beckman, 1978), (Ricciardelli et al. 1998). A survey of young people in the late 1960s found the image of the non-drinker was not tough (Davies, Stacey, 1972). The IBA code again confirms the masculine image of drinking by prohibiting just such an association: 'Treatments featuring special daring or toughness must not be used in a way which is likely to associate the act of drinking with masculinity.' Nevertheless during the NSHD's lifetime alcohol has become more easily available to women ($1) and drinking among women more socially acceptable

One would expect femininity to be associated with less drinking But alcohol use is not much considered from this perspective, nevertheless there are some indications it is the case (Huselid. Cooper, 1992). (Ricciardelli et al, 1998).

5.5.3.4 Religiosity

Self-restraint has always been seen as a religious virtue with some religious sects promoting prohibition. e g non-conformists (Larsen, 1999), while teetotalism has strong religious overtones (Barr, 1998). The 19th century temperance movement had strong religious associations and the support of some leading churchmen, e g. Cardinal Manning (Dingle, 1980). Religion is regularly reported in the General Household Survey as a reason for being a lifelong abstainer (OPCS, 1996).

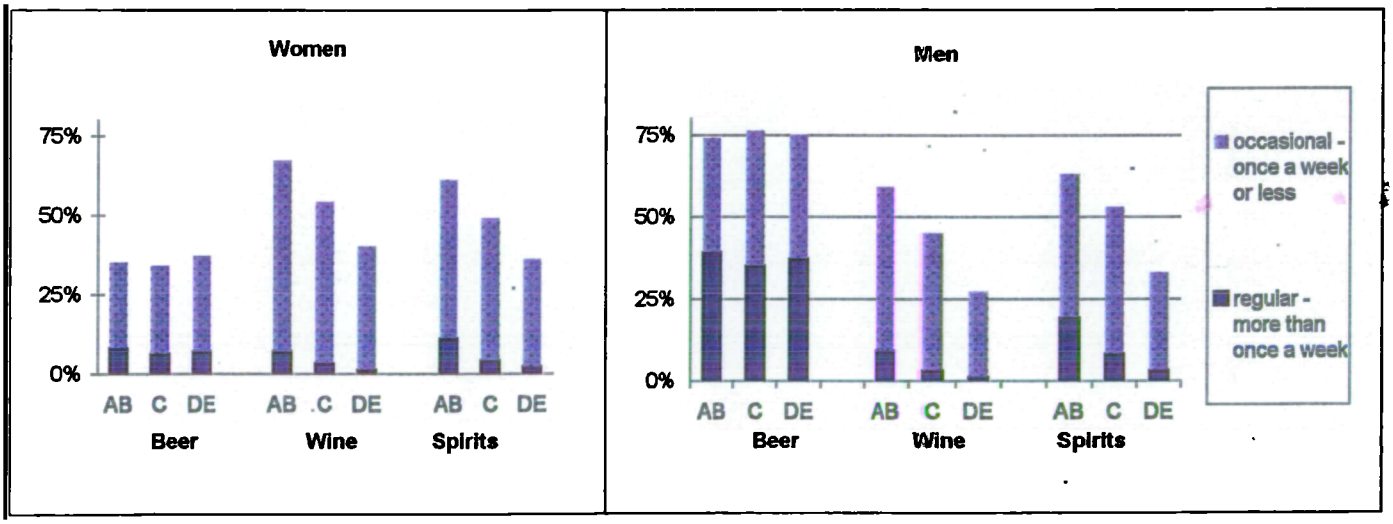
One would expect the actively religious to drink less Less drinking has been observed among the actively religious (Miller et al, 2000), (Greenfield et al, 2000), (Johnson et al, 1998), (Strawbridge et al, 1997),

(Caetano, Clark et al, 2000) though it could possible vary by denomination. One study in the Netherlands found male consumption lower in Protestants than Roman Catholics or those without a religious denomination (Knibbe et al, 1985)

5.5.4 Social Trends/Background

This discussion is mainly about social trends in Britain. Trends in other countries may be different. There are differences between Northern and Southern Europe, with consumption increasing in some Northern European countries (e.g. Germany, UK, Denmark) and decreasing in some Southern European countries (e.g. France and Italy) (Simpura, 1995). Figure 5.1 shows drinking habits in 1947 by social class and type of drink in Great Britain, taken from the Hulton Readership Survey (see §4.5.4 for a discussion of the source). Unfortunately figures are not given on overall frequency of alcohol use, or any information on quantity. Figures are available from 1947 to 1955, and maintain the same overall pattern between social classes, so the earliest year is shown. Between 1947 and 1955 the most notable change is the decline in beer drinking by all social groups. The social classes approximately correspond to RG social class as AB is RG social class I and II, C is III and DE is IV and V.

Figure 5-1 Alcohol use by social class in 1947



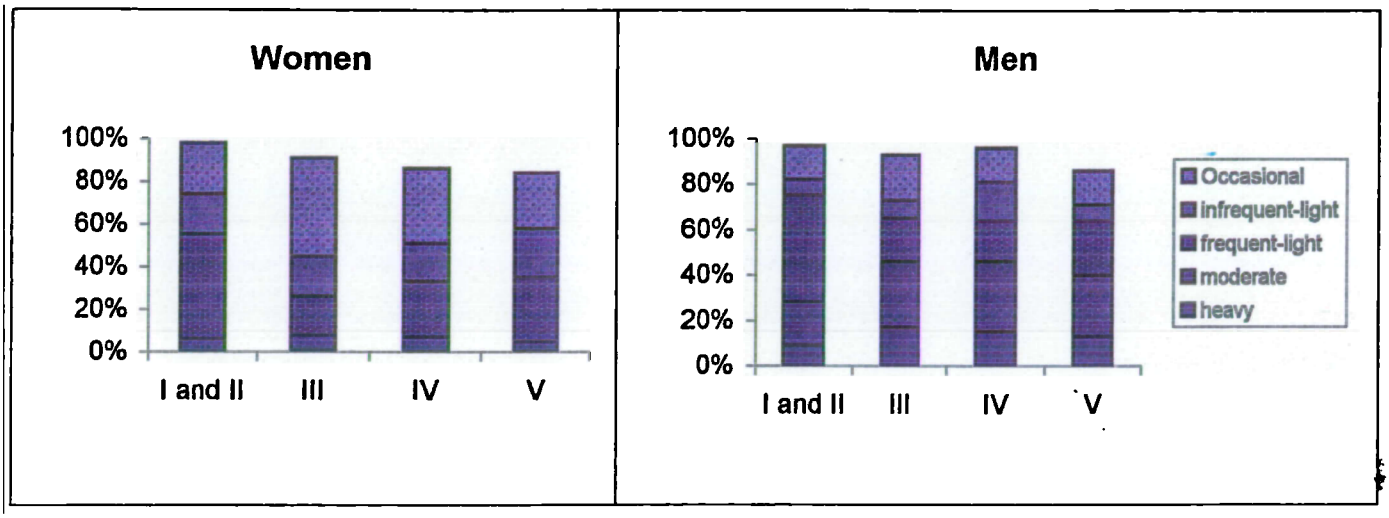
On these measures of drinking frequency there is little difference between social classes for men drinking beer, which is the most popular male drink, but non-manual men drink wine and spirits more often. Assuming all groups drank much the same per occasion it would suggest that non-manual men drank more, but it is possible that manual men drank more heavily on fewer occasions, so higher frequency may not translate into higher consumption. However this data does not suggest that non-manual men were drinking less. For women there is little difference between social classes for beer drinking, but beer is the least popular drink for women. Non-manual women drank wine and spirits much more often. This suggests non-manual women were drinking more than manual women.

Figure 5.2 shows alcohol use by RG social class in 1965 in a London suburb; this is now using a quantity/frequency measure, which represents a combination of how often people drink and how much they drink on each occasion (Edwards et al, 1972), and as such approximates to amount consumed. For

men it looks as if non-manual men could be moving towards drinking less. Fewer men from social classes I and II are in the moderate and heavy categories and more are in the frequent-light, infrequent-light and occasional categories. There are virtually no women in the heavy category, and few in the moderate category, but social class I and II women look as if they drink more often and probably more.

For women there is a pattern of the non-manual being more likely to drink consistently until the 1980s (Edwards et al, 1972), (Dight, 1976), (Wilson, 1980), (Breeze, 1985), (OPCS, 1990). This impression is also reflected back by the mass media. An analysis of the portrayal of drinking on television in 1983 confirms the stereotype of drinking by the rich and well off (Hansen, 1986).

Figure 5-2 Alcohol use in 1965 for men and women.



As regards social trends over time there is a long-standing trend for non-manual women to be more likely to drink, to drink more often and to drink more. For men it is hard to say whether there is a trend over time or not. These two surveys could be interpreted as an emerging trend for non-manual to drink less than others when previously they had drunk more. They could equally be interpreted as alcohol consumption being an accepted part of men's lives in all social classes throughout most of the NSHD's lifetime, but beginning to decline for non-manual men. There are much more obvious social trends in the type of alcohol consumed. In the 1950s the non-manual groups drank more wine/spirits and less beer than the others (Figure 5.1 above). Wine and spirits have led the rise in consumption; wine up by 513% between 1958 and 1988, spirits up by 325% between 1950 and 1988 and beer up by 46% between 1950 and 1988 (CS0, 1960), (CSO, 1969), (CS0, 1980), (CSO, 1991)

It would be possible to interpret these trends with more confidence, if the same pattern had been observed in other countries. These trends are not inconsistent with a study in the Netherlands from 1958 to 1981 of both men and women, which found increases in consumption by all social groups and a consistently higher mean consumption in the higher SES groups (measured by education) (Knibbe et al, 1985). A study in Sweden from 1971 to 1994 found that non-manual women were more likely to be moderate or heavy drinkers in 1971, but the trends reversed by 1994, by which time manual women were more likely to fall into that category (Romelsjo, Lundberg, 1996).

During the 1980s in Britain one would expect little indication of social class differences between men, unless non-manual men are going to lead a trend to drink less. For women one would expect more drinking among the non-manual classes, but possibly following the Swedish example a fall off among non-manual women and an increase among manual women, eventually.

Few studies look at rates of change between social classes. One study for Finland between 1973 and 1983 of mainly men found little evidence of different rates of change among different occupational groups (Aro et al, 1986). This is difficult to interpret without knowledge of Finnish social trends.

5.6 Measures

Measures used for explanatory categories are described in general in the chapter 3 and in detail in Appendix A. In keeping on with the hypothesis (§3.6.1), they are considered in four categories; education, social circumstances, image and background.

5.7 Missing data

Missing data is discussed in chapter 3.6.4. Additional problems are presented by using the diet diaries, from which the alcohol consumption has been calculated. As explained previously missing diet diaries could invalidate the results if those who did not fill in their diaries had different alcohol intakes (§3.6.4). One way of examining that possibility is to compare the people who provided the diet information used in 1982 with those who did not provide diet information in 1989 and vice versa. Neither men nor women who only provided a diet diary in one of 1982 and 1989 were significantly more likely to report alcohol intakes over the 'low-risk' threshold, nor was there any significant difference in their total alcohol intakes. However they could still have a different relationship with the explanatory variables, which could distort the analysis. This was checked by looking to see if the relationship between drinking status ('low-risk' or not) in one year and each potential explanatory measure depended on the presence or absence of a diary in the other year, (i.e. there was an interaction between an explanatory measure and presence or absence of a diary at another time), using logistic regression. Very few such interactions were found. So, there is very little evidence that people who did not always fill in a diet diary (i.e. filled one in 1982 or 1989) had an alcohol intake with a different relationship with the possible explanatory measures than the people who filled in diet diaries on both occasions. This provides some re-assurance that the remaining data represents relationships faithfully. In addition, in the adjusted analyses presented below the data used has a very similar social composition to the original sample, though it contains less than half the NSHD members.

5.8 Results

5.8.1 Alcohol use in 1982

5.8.1.1 Unadjusted relationships

Table 5.1 shows the childhood and adolescence measures against 'low-risk' drinking status in 1982. This is before the public health message was clearly broadcast or recognised. For women at age 36 in 1982 'low-risk' drinking is associated with less education, less advantageous social circumstances, some aspects of image in the expected direction and a less advantageous background. More education, parents owning their

own home, being popular and less feminine and having educated or non-manual parents are all associated with more risky drinking habits. Childhood anxiety disorder (CAD) is weakly associated with 'low-risk' drinking This is similar to smoking where CAD was associated with less smoking initiation.

For men there is very little association between the childhood and adolescent measures of education, social circumstances and background and 'low-risk' drinking. However image is operating as expected; the rebellious, the more sociable, the more masculine and the less religious are significantly more likely to indulge in 'risky' drinking.

Table 5.2 shows the adult measures against 'low-risk' drinking status in 1982 at age 36. For women the adulthood measures associated with drinking over the 'low-risk' limit are education, social circumstances, image, and background. As with the childhood and adolescence factors more education, better material circumstances, the sociability, masculinity and lack of religiosity aspects of image and current non-manual social class are associated with more women drinking over the 'low-risk' limit. Higher income is associated with riskier drinking. Social support in the form of marriage or children is associated with 'low-risk' drinking, but social support in terms of membership of clubs or associations is not.

For men only the adult measures of social circumstances and the religiosity aspect of image are significantly related to 'low-risk' drinking. Home ownership, marriage and children are all associated with 'low-risk' drinking, while a higher, comfortable income and membership of clubs and associations is associated with more risky drinking.

Table 5-1: Childhood/Adolescent measures and 'low-risk' drinking status in 1982 at age 36 - unadjusted

		WOMEN				MEN			
		Low risk	More risk	N		Low risk	More risk	n	
Education									
Cognitive potential above av	Yes	**86%**	**14%**	**660**		63%	37%	605	
	no	**91%**	**9%**	**456**	**P<.05**	64%	36%	461	Ns
Left school at 16, or 16+	No	**91%**	**9%**	**621**		64%	36%	602	
	yes	**85%**	**15%**	**575**	**P<.01**	64%	36%	560	Ns
Parents interested in primary school	No	**92%**	**8%**	**469**		66%	34%	522	
	yes	**86%**	**14%**	**773**	**P<.01**	61%	39%	677	P< 2
Social Circumstances									
Material Circumstances									
Parents own home @ 4	Yes	87%	13%	343		64%	36%	305	
	No	89%	11%	833	Ns	63%	37%	822	Ns
Parents own home @ 15	Yes	**86%**	**14%**	**463**		66%	34%	427	
	No	**90%**	**10%**	**616**	**P<.05**	63%	37%	618	Ns
Social Support									
Parental divorce	Yes	83%	17%	89		67%	33%	91	
	No	88%	12%	1152	Ns	63%	37%	1107	Ns
Parents alive and well	No	89%	11%	168		61%	39%	157	
	Yes	88%	12%	910	Ns	65%	35%	891	Ns
Interests with parents	Yes	88%	12%	867		63%	37%	729	
	No	90%	10%	209	Ns	65%	35%	331	NS
Interests with peers	Yes	88%	12%	901		63%	37%	928	
	No	92%	8%	174	P<.2	69%	31%	131	P< 2
Goes to clubs at 13	Yes	88%	12%	677		64%	36%	649	
	No	89%	11%	399	Ns	63%	37%	411	Ns
Goes to clubs at 15	Yes	87%	13%	729		64%	36%	723	
	No	91%	9%	328	P<.2	63%	37%	312	Ns
Stress									
Childhood anxiety depression	Yes	95%	5%	83		67%	33%	58	
	No	88%	12%	764	P<.1	64%	36%	827	ns
Image									
Conformity									
Conforms at 13	Yes	89%	11%	873		**65%**	**35%**	**790**	
	No	87%	13%	183	Ns	**58%**	**42%**	**252**	**P<.05**
Conforms at 15	Yes	89%	11%	821		66%	34%	768	
	No	87%	13%	236	Ns	59%	41%	263	P<.1
Works badly at school at 13	No	89%	11%	1017		64%	36%	945	
	yes	83%	17%	53	P<.2	55%	45%	104	P< 1
Works badly at school at 15	No	89%	11%	993		65%	35%	916	
	yes	86%	14%	70	Ns	59%	41%	119	Ns
Sociability									
Very popular at 13	Yes	**81%**	**19%**	**131**		**56%**	**44%**	**155**	
	no	**91%**	**9%**	**947**	**P<.005**	**65%**	**35%**	**901**	**P<.05**
Makes friends very easily at 13	Yes	85%	15%	157		59%	41%	171	
	no	89%	11%	913	P< 2	65%	35%	868	P< 2
Makes friends very easily at 15	Yes	88%	12%	176		66%	34%	169	
	no	89%	11%	881	Ns	63%	37%	861	Ns
Gender-identity									
Exhibits feminine behaviour at 13	Yes	88%	12%	325		**69%**	**31%**	**254**	
	no	89%	11%	702	Ns	**62%**	**38%**	**777**	**P<.05**
Exhibits feminine behaviour at 15	Yes	**92%**	**8%**	**381**		68%	32%	271	
	no	**86%**	**14%**	**638**	**P<.01**	62%	38%	748	P<.1
Religiosity									
Religious upbringing	yes	88%	12%	1009		**66%**	**34%**	**906**	
	no	88%	12%	233	Ns	**57%**	**43%**	**293**	**P<.01**
Goes to Sunday school at 11	Yes	88%	12%	935		65%	35%	830	
	No	89%	11%	169	Ns	61%	39%	243	Ns
Background									
Father non-manual at 4	Yes	**85%**	**15%**	**516**		65%	35%	462	
	No	**90%**	**10%**	**632**	**P<.01**	62%	38%	647	Ns
Father non-manual at 15	Yes	**85%**	**15%**	**462**		65%	35%	434	
	No	**91%**	**9%**	**543**	**P<.005**	64%	36%	529	Ns
Mother went to secondary school	Yes	**84%**	**16%**	**425**		64%	36%	427	
	No	**91%**	**9%**	**692**	**P<.0001**	64%	36%	642	Ns
Father went to secondary school	Yes	**84%**	**16%**	**495**		63%	37%	472	
	No	**92%**	**8%**	**619**	**P<.0001**	64%	36%	589	Ns

Table 5-2: Adult measures and 'low-risk' drinking status in 1982 at age 36 - unadjusted

		WOMEN				MEN			
		Low-risk	More risk	N		Low-risk	More risk	n	
Education									
Has O levels or more	Yes	**82%**	**18%**	**353**		65%	35%	502	
	no	**90%**	**10%**	**833**	**P<.001**	63%	37%	644	Ns
Spouse with qualifications	Yes	87%	13%	622		67%	33%	490	
	No	89%	11%	537	Ns	61%	39%	673	P< 1
Spouse left school at 16, or 16+	Yes	**86%**	**14%**	**660**		64%	36%	630	
	No	**91%**	**9%**	**652**	**P<.05**	63%	37%	552	ns
Social circumstances									
Material Circumstances									
Owns own home	Yes	87%	13%	958		**65%**	**25%**	**914**	
	No	91%	9%	284	P< 1	**57%**	**43%**	**283**	**P<.05**
Low income or none (own)	Yes	**91%**	**9%**	**809**		**67%**	**33%**	**574**	
	No	**79%**	**21%**	**343**	**P<.001**	**60%**	**40%**	**574**	**P<.05**
Adequate income	Yes	88%	12%	995		**62%**	**38%**	**952**	
	No	88%	12%	221	Ns	**69%**	**31%**	**239**	**P<.05**
Go without - lack of money	Yes	90%	10%	190		68%	32%	163	
	No	88%	12%	1039	Ns	63%	37%	1029	P< 2
Social Support									
Married	yes	**89%**	**11%**	**1064**		**65%**	**35%**	**1008**	
	no	**83%**	**17%**	**178**	**P<.05**	**57%**	**43%**	**191**	**P<.05**
Children at home	No	**78%**	**22%**	**196**		**55%**	**45%**	**324**	
	Yes	**90%**	**10%**	**1046**	**P<.0001**	**66%**	**34%**	**875**	**P<.0001**
Member of clubs, etc	Yes	87%	13%	610		**60%**	**40%**	**715**	
	No	89%	11%	631	Ns	**68%**	**32%**	**483**	**P<.05**
Employed or housewife	Yes	88%	12%	1124		63%	37%	1134	
	No	91%	9%	118	Ns	62%	38%	65	ns
Stress									
Depressive symptoms	Yes	87%	13%	102		64%	37%	39	
	No	88%	12%	1132	Ns	54%	46%	1155	ns
Image									
Sociability									
Friends round weekly or more	Yes	**84%**	**16%**	**411**		62%	38%	311	
	No	**90%**	**10%**	**822**	**P<.01**	64%	36%	880	Ns
Gender-identity									
In male dominated occupation	Yes	**77%**	**23%**	**114**		62%	38%	1005	
	no	**89%**	**11%**	**1127**	**P<.000**	68%	32%	187	P<.1
Religiosity									
Takes part in religious activities	Yes	**93%**	**7%**	**401**		**75%**	**25%**	**229**	
	no	**86%**	**14%**	**835**	**P<.001**	**61%**	**39%**	**969**	**P<.0001**
Has religious belief	yes	**90%**	**10%**	**875**		**66%**	**34%**	**646**	
	no	**83%**	**17%**	**336**	**P<.005**	**59%**	**41%**	**523**	**P<.001**
Background									
Social class non-manual	Yes	**85%**	**15%**	**669**		64%	36%	661	
	No	**92%**	**8%**	**579**	**P<.000**	62%	38%	524	P< 2

5.8.1 2 Adjusted analysis

A stepwise model selection procedure was used to determine how much influence each of these measures might have on 'low-risk' drinking when considered together as described in chapter 3 6.6. Table 5.3 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with drinking above the "low-risk" limit in 1982. In order to explore the effect of circumstances the cohort lived through, the model was built up in chronological stages. first the childhood measures associated with more than 'low-risk' drinking (model 1) and then the childhood and adult ones considered together (model 2) Both these models are shown in Table 5 3 for women and men.

Table 5-3: Odds ratios and confidence intervals for measures significantly associated with drinking over the 'low-risk' limit in 1982.

		Women		Men	
		Model 1	Model 2	Model 1	Model 2
Education					
Parents interested in primary school	yes			1.9* (1.05-1.82)	
	no			1	
Social Circumstances at 36					
Owns own home	yes				1
	No				1.5* (1.09-2.16
Low income or none (own)	yes		1		1
	No		2.3*** (1.45-3.61)		1.7**(1.26-2.38
Adequate Income	yes				1.4* (1.003-2.0
	No				1
Children at home	Yes				1
	no				1.4* (1.04-1.90
Member of clubs, etc	yes				1.4* (1.09-.89)
	no				1
Image					
Conformity					
Conforms at 15	Yes			1	
	No			1.4* (1.02-1.89)	
Sociability					
Very popular at 13	yes	1.8* (1.04-3.09)	2.1* (1.20-3.75)	1.6* (1.10-2.28)	1.5* (1.01-2.12
	no	1	1	1	1
Gender-identity					
Exhibits feminine behaviour at 15	no	1.6* (1.01-2.57)			
	yes	1			
In male-dominated occupation at 36	yes		2.0* (1.08-3.83)		
	No		1		
Religiosity					
Religious upbringing	yes			1	
	No			1.6* (1.14-2.12)	
Takes part in religious activities at 36	yes		1		1
	no		2.4* (1.37-4.04)		2.3*** (1.53-3.3
Background					
Father non-manual at 15	yes	2.0** (1 33-3.07)	1 8* (1.13-2.77)		
	no	1	1		
Social class non-manual at 36	yes		1.8* (1.13-2.96)		1
	No		1		1.4* (1.04-1.95
N		890	882	955	994
Chi squared		21.7	63.6	20.5	57.9
Df		3	6	4	8
Nagelkerke r square		047	.135	.029	078

P < .05, ** P < .005, *** P < .0005

For women the childhood measures associated with drinking above the limit are aspects of image and background, i.e. sociability, lack of femininity and a non-manual background. Adult measures have an additive effect. The childhood measures are re-enforced, and social circumstances and religiosity are also significant. Better material circumstances (higher income) are associated with more drinking over the 'low-risk' limit. There were no interactions in either model.

For men the childhood measures associated with drinking over the 'low-risk' limit are education and aspects of image. In childhood it is valuing education (parents taking an interest in primary school), which is associated with being more likely to drink over the 'low-risk' limit. Most aspects of image are associated with 'low-risk' drinking in the expected direction, i.e. the conformist, the less social and the less masculine are more likely to be 'low-risk' drinkers. On the whole adulthood measures have an additive effect, and current social circumstances and background are also significant. However social circumstances operate inconsistently. Home ownership is associated with 'low-risk' drinking, but higher income and adequate income are associated with more risky drinking. Social support represented by membership of clubs is associated with more risky drinking, but represented by children at home it is associated with less 'low-risk' drinking. There is an interaction between home-ownership and non-manual social class. Having either of those attributes is related to being in the 'low-risk' category, suggesting they are measuring the same concept.

Sensitivity analysis was carried out to allow for the effect of the original sample stratification and to check for any alternative models. Weighting back to the original sample only wobbled the odds ratios slightly. Considering other possible models showed that the childhood models were more similar than they look, in that conformity and parental interest were almost significant for women, and gender-identity was almost significant for men. In the adulthood model for men conformity just failed to be significantly associated with 'low-risk' drinking. Education would be significant for men if it was considered in four groups, representing finer gradations of education, rather than dichotomized because the relationship with drinking is not linear. The most educated are most likely to have 'low-risk' drinking habits; those with a middling amount of education (some qualifications but not university) are least likely to have 'low-risk' drinking habits. However throughout this thesis all the measures have been dichotomised, and it would be difficult to justify grouping one measure into four without going back and doing the same wherever else possible.

Comparing men and women in childhood a model for both sexes (using all the measures found to be associated with drinking status in the multiple regression models for each sex plus of course sex) found all aspects of image and parental interest significant, with no interactions with sex. This is consistent with some of these just missing significance in the separate sex models. However father's social class did interact with sex, suggesting that there is a difference between the sexes; i.e. having a non-manual father is associated with women drinking over the 'low-risk' limit but has no effect on men. Comparing men and women in adulthood, in the same way, most aspects of image (sociability, masculinity and religiosity) are significant and do not interact with sex. Social class (parental at 15 and current) does interact with sex, suggesting that non-manual social class is associated with women being more likely to drink over the 'low-risk limit and men to be less likely to do so. Higher income is significant in a combined model and does not interact with sex. The other aspects of social circumstances are not significant and do not interact with sex. This may be because there is a lack of power to detect these complex effects for women. Although the sample size is quite large, few women reported drinking over the low-risk limit, so the power is lower, particularly to detect the effect of rarer events. Measures which are significant in unadjusted analysis, but quite rare are women being unmarried, or not having children at home, and that may be why do not show any effect. However it does not detract from the overall observation that better social circumstances are not consistently associated with low-risk drinking.

5.8.2 Changes in drinking habits between 1982 and 1989

Table 5 4 shows the number of men and women in the cohort who changed their drinking habits between 1982 and 1989. Between 1982 and 1989 the proportion of men drinking over the 'low-risk' limit fell, while the proportion of women drinking over the 'low-risk' limit went up. It is hard to see why men should respond to the public health message while women ignored it. It may be the usually observed age-related decline for men, counterbalanced for women by the social trend for women to drink more.

Table 5-4: Numbers who changed drinking category between 1982 and 1989

	Women		Men	
	'Low-risk' drinking at 43 in 1989	More than 'low-risk' drinking at 43	'Low-risk' drinking at 43 in 1989	More than 'low-risk' drinking at 43
'Low-risk' drinking at 36 in 1982	757	70	483	88
More than 'low-risk' drinking at 36	45	67	115	203

5.8.2.1 Changing to 'low-risk' drinking

5.8.2.1.1 Unadjusted relationships

Tables 5.5, 5.6 and 5.7 give an analysis of the group who were not low-risk drinkers but become so by 1989, i.e. these are the people who followed the public health message, though not necessarily intentionally. Because relatively few women were not 'low-risk' drinkers in 1982, the numbers of women who changed from more than 'low-risk' drinking to 'low-risk' drinking is low.

Table 5.5 shows the childhood measures and their relationship with changing to 'low-risk' drinking. There are almost no significant relationships

Table 5-5: Childhood/Adolescent measures and changing to 'low-risk' drinking by age 43 in 1989 for those who were not 'low-risk' drinkers at age 36 (in 1982) - unadjusted.

		WOMEN				MEN			
		not 'low-risk' in 82 or 89	'low-risk' by 1989	n		not 'low-risk' in 82 or 89	'low-risk' by 1989	n	
Education									
Cognitive potential above av.	Yes	60%	40%	73		**70%**	**30%**	**168**	
	no	46%	53%	28	Ns	**57%**	**43%**	**114**	**P<.05**
Left school at 16, or 16+	No	68%	32%	37		62%	38%	152	
	yes	57%	43%	69	Ns	67%	33%	155	Ns
Parents interested in primary school	No	73%	27%	26		60%	40%	127	
	yes	56%	44%	86	P< 2	67%	33%	191	Ns
Social Circumstances									
Material Circumstances									
Parents own home @ 4	Yes	50%	50%	34		65%	35%	81	
	no	62%	38%	71	Ns	63%	37%	223	Ns
Parents own home @ 15	Yes	58%	42%	50		66%	34%	110	
	no	65%	35%	43	Ns	64%	36%	164	Ns
Social Support									
Parental divorce	Yes	45%	55%	11		60%	40%	25	
	No	61%	39%	101	Ns	64%	36%	293	Ns
Parents alive and well	No	**82%**	**18%**	**17**		67%	33%	46	
	Yes	**56%**	**44%**	**79**	**P<.05**	64%	36%	229	ns
Interests with parents	Yes	67%	33%	76		65%	35%	198	
	No	75%	25%	16	P<.2	66%	34%	86	Ns
Interests with peers	Yes	59%	41%	82		**68%**	**32%**	**251**	
	No	70%	30%	10	Ns	**49%**	**51%**	**33**	**P<.05**
Goes to clubs at 13	Yes	57%	43%	61		64%	36%	168	
	No	65%	35%	31	Ns	67%	33%	116	Ns
Goes to clubs at 15	Yes	54%	46%	71		65%	35%	190	
	No	74%	26%	19	P<.2	62%	38%	86	Ns
Stress									
Childhood anxiety depression	Yes	75%	25%	4		72%	28%	15	
	No	58%	42%	66	Ns	65%	35%	223	ns
Image									
Conformity									
Conforms at 13	Yes	58%	42%	77		66%	34%	207	
	No	64%	36%	14	Ns	61%	39%	75	Ns
Conforms at 15	Yes	56%	34%	70		64%	36%	197	
	No	63%	37%	19	Ns	64%	36%	75	Ns
Works badly at school at 13	No	59%	41%	86		64%	36%	251	
	yes	60%	40%	5	Ns	72%	28%	32	Ns
Works badly at school at 15	No	57%	43%	85		63%	37%	241	
	yes	80%	20%	5	Ns	61%	39%	33	Ns
Sociability									
Very popular at 13	Yes	65%	35%	20		68%	32%	50	
	no	58%	42%	72	Ns	65%	35%	234	Ns
Makes friends very easily at 13	Yes	56%	44%	18		67%	33%	49	
	no	62%	38%	73	Ns	65%	35%	231	Ns
Makes friends very easily at 15	Yes	50%	50%	14		61%	39%	46	
	no	59%	41%	76	Ns	64%	36%	227	Ns
Gender-identity									
Exhibits feminine behaviour at 13	Yes	100%	0%	2		75%	25%	4	
	no	58%	42%	89	Ns	65%	35%	279	Ns
Exhibits feminine behaviour at 15	Yes	68%	32%	19		65%	35%	63	
	no	53%	47%	68	Ns	63%	37%	207	Ns
Religiosity									
Religious upbringing	yes	58%	42%	93		67%	33%	231	
	no	68%	32%	19	Ns	56%	44%	87	P< 1
Goes to Sunday school at 11	Yes	59%	41%	83		65%	35%	229	
	No	67%	33%	12	Ns	64%	36%	59	Ns
Background									
Father non-manual at 4	Yes	56%	44%	57		62%	38%	120	
	no	59%	41%	44	Ns	65%	35%	181	Ns
Father non-manual at 15	Yes	56%	44%	55		66%	34%	116	
	no	59%	41%	32	Ns	65%	35%	137	Ns
Mother went to secondary school	yes	60%	40%	55		65%	35%	124	
	no	59%	44%	43	Ns	65%	35%	154	Ns
Father went to secondary school	yes	57%	43%	63		66%	34%	135	
	no	60%	40%	35	Ns	66%	35%	145	Ns

Table 5.6 shows the adulthood measures at age 36 and their relationship with changing to 'low-risk' drinking, between ages 36 and 43 There are almost no significant relationships

Table 5-6: Adulthood measures at age 36 and changing to 'low-risk' drinking by age 43 in 1989 for those who were not 'low-risk' drinkers at age 36 (in 1982) - unadjusted.

		WOMEN				MEN			
		not 'low-risk' in 82 or 89	'low-risk' by 1989	n		not low-risk' in 82 or 89	'low-risk' by 1989	n	
Education									
Has O levels or more	Yes	54%	46%	54		65%	35%	132	
	no	67%	33%	56	P<.2	62%	38%	170	ns
Spouse with qualifications	Yes	57%	43%	63		69%	31%	118	
	No	64%	36%	42	Ns	61%	39%	191	P<.2
Spouse left school at 16, or 16+	Yes	62%	38%	63		66%	34%	163	
	No	57%	43%	44	Ns	61%	39%	155	ns
Social circumstances									
Material circumstances									
Owns own home	Yes	57%	43%	95		65%	35%	231	
	No	77%	23%	17	P<.2	62%	38%	86	Ns
Low income (own) or none	Yes	63%	38%	48		60%	40%	130	
	No	57%	43%	56	P<.2	67%	33%	176	P<.2
Adequate Income	Yes	60%	40%	89		64%	36%	270	
	No	62%	38%	21	Ns	59%	41%	46	ns
Go without - lack of money	Yes	36%	64%	14		67%	33%	36	
	No	64%	36%	97	P<.1	63%	37%	280	ns
Social Support									
Married	Yes	61%	39%	87		66%	34%	255	
	No	56%	44%	25	Ns	56%	44%	63	P<.2
Children at home	No	58%	42%	33		66%	34%	109	
	Yes	61%	39%	79	ns	63%	37%	209	ns
Member of clubs, etc	Yes	63%	37%	60		64%	36%	209	
	No	56%	44%	52	Ns	64%	36%	109	NS
Employed or housewife	Yes	59%	41%	106		65%	35%	304	
	No	67%	33%	6	Ns	50%	50%	14	Ns
Stress									
Depressive symptoms	Yes	44%	56%	9		60%	40%	15	
	No	62%	38%	102	Ns	64%	36%	303	ns
Image									
Sociability									
Friends round weekly or more	Yes	66%	34%	47		64%	36%	83	
	No	55%	45%	62	Ns	64%	36%	232	Ns
Gender-identity									
In male dominated occupation	Yes	58%	42%	19		66%	34%	277	
	No	60%	40%	93	Ns	48%	52%	40	P<.05
Religiosity									
Takes part in religious activities	Yes	48%	52%	23		62%	38%	45	
	No	64%	36%	88	P<.2	64%	36%	273	Ns
Has religious belief	Yes	59%	41%	71		64%	36%	154	
	No	60%	40%	40	Ns	63%	37%	160	Ns
Background									
Social class non-manual	Yes	56%	44%	79		66%	34%	178	
	No	70%	30%	33	P<.2	62%	38%	136	ns

Table 5.7 shows the adulthood measures at age 43 and their relationship with changing to 'low-risk' drinking, between ages 36 and 43. There are almost no significant relationships, and there are no more than would have been expected by chance However for men the one factor that does occur in 1982 at age 36 as related to changing to 'low-risk' drinking is not working in a mainly male occupation, and that same measure recurs in 1989.

Table 5-7: Adulthood measures at age 43 and changing to 'low-risk' drinking by age 43 in 1989 for those who were not 'low-risk' drinkers at age 36 (in 1982) - unadjusted.

		WOMEN				MEN			
		not 'low-risk' in 82 or 89	'low-risk' by 1989	n		not low-risk' in 82 or 89	'low-risk' by 1989	n	
Education									
Spouse with qualifications	Yes	58%	42%	79		67%	33%	174	
	No	64%	36%	31	ns	60%	40%	138	ns
Social circumstances									
Material circumstances									
Owns own home	Yes	60%	40%	102		64%	36%	264	
	no	60%	40%	10	Ns	65%	35%	54	Ns
Income band higher	Yes	60%	40%	50		66%	34%	176	
	No	60%	40%	62	Ns	61%	39%	142	Ns
Adequate Income	Yes	60%	40%	102		65%	35%	270	
	No	80%	20%	10	P<.2	61%	39%	43	Ns
Go without - lack of money	Yes	86%	14%	7		64%	36%	34	
	No	58%	41%	105	P<.2	64%	36%	282	Ns
Employed or housewife	Yes	58%	42%	93		65%	35%	299	
	No	68%	32%	19	Ns	47%	53%	19	P<.2
Social support									
Married	yes	60%	40%	84		64%	36%	262	
	no	61%	39%	28	Ns	63%	37%	56	Ns
Children at home	No	54%	46%	26		65%	35%	68	
	Yes	62%	38%	86	Ns	64%	36%	250	Ns
Stress									
Depressive symptoms	Yes	68%	32%	22		48%	52%	23	
	No	58%	42%	90	Ns	65%	35%	294	P<.2
Image									
Sociability									
Frequent social contacts	Yes	76%	24%	39		72%	28%	64	
	No	54%	46%	83	P<.1	62%	38%	254	P<.2
Gender-identity									
In male dominated occupation	Yes	64%	36%	22		67%	33%	272	
	no	59%	41%	90	Ns	39%	61%	36	P<.005
Religiosity									
Takes part in religious activities	Yes	77%	23%	13		65%	35%	43	
	No	57%	43%	98	P<.2	64%	36%	274	Ns
Background									
Social class non-manual	Yes	62%	38%	85		69%	31%	186	
	No	56%	44%	27	Ns	56%	44%	128	P<.05

5.8.2.1.2 Adjusted analysis

Given the lack of significant relationships for women, and the small amount of data any attempt to produce an adjusted model for women risks over-fitting the data and capitalizing on chance relationships. Power

analysis confirmed that with this sample size for women only very strong effects could be expected to be detected reliably; equivalent to odds ratios of about 3 0. Initial adjusted analysis suggested some possible relations. i.e. that changing to low-risk drinking might be associated with lack of money, less sociability, giving up religious activities, non-manual social class and cognitive potential below average.

A stepwise model selection procedure was used to determine how much influence each of these measures might have on changing to 'low-risk' drinking for men, when considered together ($3 6 6) Table 5.8 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with men changing to "low-risk" drinking between 1982 and 1989. In a multiple regression model these factors are not working in a male-dominated occupation and manual social class. Current unemployment in 1989 is weakly associated with changing to low-risk drinking, but is too rare in this group to be likely to be detectable. Current depression is weakly associated with not changing to low-risk drinking, but again is too rare to be likely to be detected.

Table 5-8: Odds ratios and confidence intervals for measures significantly associated with changing to 'low-risk' drinking from not 'low-risk' drinking between 1982 and 1989 – men only

Category	Measure		Odds ratio and CI
Image Gender-identity	In male dominated occupation at 36	Yes	1
		No	2.2* (1.1 – 4.4)
Background	Social class non-manual at 43	Yes	1
		No	1.8* (1.1-2.9)
N			313
Chi squared			11.2
Df			2
Nagelkerke r square			.048

P < .05, ** P < .005, *** P < 0005

5.8.2.2 Changing from 'low-risk' drinking

5.8.2.2.1 Unadjusted relationships

Tables 5.9, 5.10, 5.11 provide an analysis of the group who were 'low-risk' drinkers in 1982, but were no longer so in 1989. Table 5.9 shows childhood measures and their relationship with changing from 'low-risk' drinking to more than 'low-risk' drinking between ages 36 and 43. For women there are few significant relationships Women who ignored the health education message appear to have had home-owning parents, gone to clubs in adolescence and gone to Sunday school. For men parental home-ownership, conformity and coming from an intact family are fairly consistently associated with staying in the 'low-risk' drinking group, i e. parental home-ownership at 4 and 15 are both associated with staying in the 'low-risk' group as are conformity at 13 and 15.

Table 5.10 shows adulthood measures at age 36 and their relationship with changing from 'low-risk' drinking to more than 'low-risk' drinking between ages 36 and 43. For women there are few significant

relationships, women who ignored the health education message appear to be more likely to be unmarried and more sociable. For men education and non-manual social class are associated with staying in the 'low-risk' drinking group.

Table 5.11 shows adulthood measures at age 43 and their relationship with changing from 'low-risk' drinking to more than 'low-risk' drinking between ages 36 and 43. For women there are few significant relationships; women who ignored the health education message appear to be more likely to be unmarried and without children. For men, as before (Table 5.10), it is non-manual social class, which is associated with staying in the 'low-risk' drinking group. Religiosity is also associated with staying in the 'low-risk' group.

Table 5-9: Childhood/Adolescent measures and changing from 'low-risk' drinking to more than 'low-risk' drinking between age 36 (in 1982) and age 43 (in 1989) -unadjusted.

		WOMEN				MEN			
		'low-risk' in 1982 and 1989	Not 'low-risk' in 1989	n		'low-risk' in 1982 and 1989	Not 'low-risk' in 1989	N	
Education									
Cognitive potential above av.	Yes	91%	9%	440		84%	16%	304	
	no	94%	6%	299	P< 2	86%	14%	215	Ns
Left school at 16, or 16+	No	92%	8%	405		82%	18%	268	
	yes	91%	9%	390	Ns	86%	14%	290	P<.2
Parents interested in primary school	No	92%	8%	311		83%	17%	252	
	yes	91%	9%	389	Ns	88%	12%	260	P< 2
Social Circumstances									
Material circumstances									
Parents own home @ 4	Yes	91%	9%	238		**90%**	**10%**	**158**	
	no	92%	8%	548	Ns	**83%**	**17%**	**380**	**P<.05**
Parents own home @ 15	Yes	**89%**	**11%**	**312**		**89%**	**11%**	**221**	
	no	**93%**	**7%**	**410**	**P<.05**	**82%**	**18%**	**292**	**P<.05**
Social Support									
Parental divorce	Yes	89%	11%	52		**72%**	**28%**	**43**	
	No	92%	8%	774	Ns	**86%**	**14%**	**528**	**P<.05**
Parents alive and well	No	94%	6%	116		78%	22%	69	
	Yes	91%	9%	603	ns	86%	14%	448	P<.2
Interests with parents	Yes	92%	8%	568		85%	15%	353	
	No	92%	8%	149	Ns	84%	16%	160	ns
Interests with peers	Yes	96%	4%	120		87%	13%	62	
	No	91%	9%	597	P<.1	85%	15%	451	ns
Goes to clubs at 13	Yes	**90%**	**10%**	**447**		84%	16%	318	
	No	**94%**	**6%**	**270**	**P<.05**	86%	14%	196	Ns
Goes to clubs at 15	Yes	90%	10%	478		83%	17%	361	
	No	94%	6%	224	P<.1	86%	14%	139	Ns
Stress									
Childhood anxiety depression	Yes	96%	4%	50		87%	13%	30	
	No	92%	8%	504	Ns	84%	16%	398	ns
Image									
Conformity									
Conforms at 13	Yes	92%	8%	593		**87%**	**13%**	**399**	
	No	88%	12%	108	P<.2	**76%**	**24%**	**101**	**P<.01**
Conforms at 15	Yes	92%	8%	561		**88%**	**12%**	**393**	
	No	90%	10%	143	Ns	**70%**	**30%**	**108**	**P<.0005**
Works badly at school at 13	No	92%	8%	685		**86%**	**14%**	**465**	
	yes	97%	3%	30	Ns	**74%**	**26%**	**43**	**P<.05**
Works badly at school at 15	No	92%	8%	669		84%	16%	448	
	yes	92%	8%	39	Ns	87%	13%	54	Ns
Sociability									
Very popular at 13	Yes	87%	13%	76		82%	18%	65	
	no	92%	8%	644	P<.2	85%	15%	443	Ns
Makes friends very easily at 13	Yes	88%	12%	90		78%	22%	78	
	no	93%	7%	623	P< 2	86%	14%	425	P<.1
Makes friends very easily at 15	Yes	88%	12%	103		81%	19%	85	
	no	92%	8%	602	P< 2	85%	15%	414	Ns
Gender-Identity									
Exhibits feminine behaviour at 13	Yes	93%	7%	218		88%	12%	144	
	no	91%	9%	466	Ns	83%	17%	356	Ns
Exhibits feminine behaviour at 15	Yes	92%	8%	271		86%	14%	146	
	no	91%	9%	407	Ns	84%	16%	344	Ns
Religiosity									
Religious upbringing	yes	92%	8%	676		85%	15%	452	
	no	91%	9%	151	Ns	83%	17%	119	Ns
Goes to Sunday school at 11	Yes	**91%**	**9%**	**629**		86%	14%	411	
	No	**97%**	**3%**	**100**	**P<.05**	79%	21%	109	P< 1
Background									
Father non-manual at 4	Yes	90%	10%	348		87%	13%	245	
	no	93%	7%	416	Ns	84%	16%	280	Ns
Father non-manual at 15	Yes	91%	9%	301		88%	12%	234	
	no	92%	8%	369	Ns	83%	17%	242	P< 2
Mother went to secondary school	yes	90%	10%	279		88%	12%	221	
	no	92%	8%	463	Ns	83%	17%	291	P<.1
Father went to secondary school	yes	91%	9%	322		86%	14%	245	
	no	92%	8%	417	ns	84%	16%	263	Ns

Table 5-10: Adulthood measures at age 36 and changing from 'low-risk' drinking to more than 'low-risk' drinking between age 36 (in 1982) and age 43 (in 1989) - unadjusted.

		WOMEN				MEN			
		'low-risk' in 1982 and 1989	Not 'low-risk' in 1989	n		low-risk' in 1982 and 1989	Not 'low-risk' in 1989	n	
Education									
Has O levels or more	Yes	92%	8%	236		**88%**	**12%**	**270**	
	no	91%	9%	554	ns	**81%**	**19%**	**283**	**P<.05**
Spouse with qualifications	Yes	91%	9%	412		84%	16%	254	
	No	91%	9%	357	ns	84%	16%	306	ns
Spouse left school at 16, or 16+	Yes	93%	7%	379		85%	15%	310	
	No	90%	10%	432	Ns	84%	16%	255	ns
Social circumstances									
Material circumstances									
Owns own home	Yes	91%	9%	646		85%	15%	457	
	no	93%	7%	181	Ns	85%	15%	114	Ns
Low income (own) or none	Yes	**93%**	**7%**	**559**		84%	16%	277	
	No	**88%**	**12%**	**207**	**P<.05**	85%	15%	275	Ns
Adequate Income	Yes	91%	9%	673		84%	16%	454	
	No	93%	7%	139	ns	86%	14%	114	ns
Go without - lack of money	Yes	93%	7%	121		81%	19%	74	
	No	91%	9%	701	ns	85%	15%	495	ns
Social support									
Married	yes	**93%**	**7%**	**718**		84%	16%	491	
	no	**84%**	**16%**	**109**	**P<.005**	90%	10%	80	P<.2
Children at home	No	90%	10%	115		88%	12%	137	
	Yes	92%	8%	712	ns	84%	16%	434	ns
Member of clubs, etc	Yes	91%	9%	417		84%	16%	332	
	No	92%	8%	409	ns	86%	14%	238	ns
Employed or housewife	Yes	92%	8%	745		84%	16%	544	
	No	88%	12%	76	Ns	88%	12%	25	Ns
Stress									
Depressive symptoms	Yes	92%	8%	61		88%	12%	17	
	No	92%	8%	761	Ns	85%	15%	551	ns
Image									
Sociability									
Friends round weekly or more		**89%**	**11%**	**262**		81%	19%	147	
		93%	**7%**	**561**	**P<.05**	86%	14%	422	P<.2
Gender-Identity									
In male dominated occupation	Yes	89%	11%	71		84%	16%	469	
	No	92%	8%	755	Ns	90%	10%	97	P<.2
Religiosity									
Takes part in religious activities	Yes	92%	8%	287		88%	12%	136	
	no	91%	9%	537	Ns	84%	16%	434	Ns
Has religious belief	yes	92%	8%	593		85%	15%	324	
	no	89%	11%	215	P<.2	85%	15%	232	Ns
Background									
Social class non-manual	Yes	91%	9%	442		**88%**	**12%**	**336**	
	No	92%	8%	383	ns	**81%**	**19%**	**227**	**P<.05**

Table 5-11: Adult measures at age 43 and changing from 'low-risk' drinking to more than 'low-risk' drinking between age 36 (in 1982) and age 43 (in 1989) -unadjusted.

		WOMEN 'low-risk' in 1982 and 1989	Not 'low-risk' in 1989	n		MEN 'low-risk in 1982 and 1989	Not low-risk in 1989	n	
Education									
Spouse with qualifications	Yes	92%	8%	457		85%	15%	343	
	No	91%	9%	330	Ns	83%	17%	210	Ns
Social circumstances									
Material circumstances									
Owns own home	Yes	91%	9%	712		84%	16%	491	
	No	94%	6%	115	Ns	86%	14%	80	Ns
Income band higher	Yes	91%	9%	368		82%	18%	273	
	No	92%	8%	459	Ns	87%	13%	298	P<.1
Adequate Income	Yes	92%	8%	713		84%	16%	504	
	No	91%	9%	109	ns	88%	12%	65	ns
Go without - lack of money	Yes	94%	6%	88		87%	13%	54	
	No	91%	9%	739	Ns	84%	16%	517	Ns
Employed or housewife	Yes	91%	9%	675		84%	16%	547	
	No	95%	5%	152	P<.2	96%	4%	24	P<.2
Social support									
Married	Yes	**93%**	**7%**	**690**		85%	15%	479	
	No	**86%**	**14%**	**137**	**P<.05**	83%	17%	92	Ns
Children at home	No	88%	12%	108		89%	11%	103	
	Yes	92%	8%	719	P<.2	84%	16%	468	P<.2
Stress									
Depressive symptoms	Yes	92%	8%	112		87%	13%	55	
	No	91%	9%	713	ns	84%	16%	516	Ns
Image									
Sociability									
Frequent social contacts		92%	8%	114		81%	19%	58	
		91%	9%	706	Ns	85%	15%	511	ns
Gender-identity									
In male dominated occupation	Yes	88%	12%	104		84%	16%	467	
	No	92%	8%	721	P<.2	87%	13%	90	Ns
Religiosity									
Takes part in religious activities	Yes	93%	7%	193		**96%**	**4%**	**89**	
	No	91%	9%	632	Ns	**83%**	**17%**	**481**	**P<.005**
Background									
Social class non-manual	Yes	91%	9%	536		**87%**	**23%**	**363**	
	No	94%	6%	291	P<.2	**80%**	**20%**	**205**	**P<.05**

5.8.2.2.2 Adjusted Analysis

Table 5.12 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with changing from "low-risk" drinking to risky drinking between 1982 and 1989, using a stepwise model selection procedure as before. Given the smaller sample sizes and the relatively low numbers who changed no attempt was made to explore the effect of circumstances the cohort lived through by building a model in chronological stages.

In a multiple regression model, for women being unmarried and having better material circumstances as a child (i.e. home ownership at 15) were associated with changing to drinking over the limit, and did not interact. Several measures just failed to reach significance as associated with changing to drinking over the limit, these were higher income at 36 and less education.

Table 5-12: Odds ratios and confidence intervals for measures significantly associated with changing from 'low-risk' drinking to drinking over the limit between 1982 and 1989

Category	Measure		Women	Men
Social Circumstances	Parents own home at 15	Yes	1.7* (1 0-3.0)	
		No	1	
	Married at 36	Yes	1	
		No	3.1**(1.7-5 6)	
	Income band higher at 43	Yes		1 8* (1 01-3 1)
		No		1
Image - Conformity	Conforms at 15	Yes		1
		No		2 7***(1 6-4 7)
Image - Religiosity	Takes part in religious activities at 43	Yes		1
		No		4.1* (1.2-13.6)
Background	Social class non-manual at 43	Yes		1
		No		1.8* (1.01-3.1)
N			722	493
Chi squared			16.0	32 3
Df			2	4
Nagelkerke r square			.05	.110

P < .05, ** P < .005, *** P < .0005

For men higher income, rebelliousness, lack of religiosity and manual social class are associated with changing to drink over the limit between 1982 and 1989. There were no interactions. Marital status seemed to be relevant; marital status at 36 and 43 were both significant when considered together in the model, but neither was significant on its own, and breaking marital status down into the four possible states, i.e. married at 36 and 43, unmarried at 36 and 43, unmarried at 36 and married at 43, married at 36 and unmarried at 43, revealed nothing of significance, although getting divorced came quite close to being significantly associated with changing to drinking more. A mother with less education appeared to be almost interchangeable with manual social class at 36 as associated with changing to drinking over the 'low-risk' limit, suggesting these are probably measuring approximately the same concept.

5.8.2.3 Change between age 36 and 43

Looking at how people moved from one group of drinkers to another between 1982 and 1989 might suggest that change is independent of the explanatory measures considered. As a final check a stepwise model selection procedure was used to determine what was related to 'low-risk' drinking at 43 allowing for drinking status in 1982 at age 36. The starting point was any childhood, adolescent or adult measure at age 36 weakly associated with change (P<. 20) in either direction between 36 and 43, plus any change of potentially important change of status between age 36 and 43, i.e. in marital status and the presence of children in the home. Other measures at age 43 were not considered, so as to get a model where the significant measures are prospective.

Table 5-13: Odds ratios and confidence intervals for measures significantly associated with drinking over the 'low-risk' limit in 1989, allowing for drinking status in 1982

		Women	Men
Education			
Cognitive potential above av.	No	1	1
	Yes	1.7* (1.03-2.8)	1.8* (1.2-2.7)
Has O levels or more	Yes	1	
	No	1.7* (1.02-2 9)	
Social Circumstances			
Marital status – married at 36 and 43	Yes		1
- unmarried at 36			3.2* (1.3-8.1)
- divorced between 36 and 43			1.6 (.9-2.9)
Married at 36	Yes	1	
	No	1.9* (1.1-3.3)	
Image			
Conformity			
Conforms at 15	yes		1
	No		1.8* (1.1-2.6)
Sociability			
Very popular and friendly at 13	yes		2.2* (1.1-4.2)
	No		
Friends round weekly or more at 36	Yes	1.7* (1.1-2.8)	
	No	1	
Gender-identity			
In male dominated occupation at 36	Yes		2.2* (1.2-4.2)
	No		1
Background			
Mother went to secondary school	yes		1
	No		1.7* (1.1-2.6)
N		815	669
Chi squared		16.4	37.9
Df		4	7
Nagelkerke r square		.032	.059

P < .05, ** P < .005, *** P < 0005

Table 5.13 shows the odds ratio. confidence interval and its associated level of significance for each measure that was significantly associated with change between age 36 and 42 allowing for drinking habits

at age 36. For women in a multiple regression model the measures independently associated with drinking over the 'low-risk' limit in 1989 allowing for drinking status in 1982 are less education. more cognitive potential, being unmarried and being more sociable. These measures are independent of social class in 1982 or 1989. The model was not affected by weighting back to the original sample

For men the measures associated with drinking over the 'low-risk' limit in 1989, allowing for drinking status in 1982 are lower cognitive potential, a change in marital status, rebelliousness, sociability, masculinity and having a less educated mother. Several different measures of sociability just failed to be associated with more than 'low-risk' drinking, so rather than conclude they were not relevant they were combined into a more extreme measure (defined as both popular and friendly at 13) of sociability which was significant. Mother's education level and cognitive ability inter-act; it is only men of above average cognitive ability whose mothers have less education who change to drinking over the limit. These measures are independent of social class in 1989. Although social class in 1982 is not significant including it makes mother's level of education not significant, perhaps because they are both measuring the same concept. Considering social class in adulthood in more detail, downward social mobility (i.e. non-manual in 1982, and manual in 1989) is almost associated with change to drinking within the 'low-risk' limit Attending religious activities in 1989 and not working in 1989 just fails to be associated with changing to 'low-risk' drinking.

A combined model for both sexes has above average cognitive potential, conformity, both measures of sociability and masculinity all significantly associated with drinking at more than 'low-risk' levels in 1989, allowing for 1982. None of these measures interact with sex. Both marital status between 1982 and 1989 and mother's educational level interact with sex, suggesting these are operating differently for men and women. Education just fails to be significant.

5.9 Discussion

This analysis considers alcohol use in one representative group of British people in the 1980s in the light of contemporary health education recommendations, i.e. for women to drink less than 14 units a week and for men to drink less than 21 units a week. This discussion largely concerns adjusted relationships, i e. the relationship found when allowing for measures in the other three categories Before discussing these results there are some caveats that could potentially affect the interpretation. These concern the outcome, power and measurement error.

The outcome considered here was not drinking over the low-risk threshold. So, this analysis is not comparable with analysis which considers other definitions of recommended alcohol use, or looks at heavy drinking or problem drinking. However it does evaluate behaviour against the health education message.

As pointed out in the results there are a few cases where an effect may not be observed because of insufficient power rather than because it does not exist This is most likely to happen if the event is quite rare in this sample. A stronger relationship is needed to detect an effect for a relatively rare event. In the multiple regression analysis of drinking status at 36 the samples are about 900, so there is sufficient power to detect smallish effects (odds ratios of about 1 6) as long as the event occurs for more than about 20% of

the sample. For men and women the measures that are significant in unadjusted analysis are, with the exception of sociability, marriage and having children at home for women, common enough not to suffer from insufficient power. Sociability was significant in the multiple regression models for men and women. So, with the exception of marriage and children at home for women, lack of power does not appear to be an issue. The analysis of changing drinking categories has smaller samples, and so has more risk of failing to detect effects. However their results are in broad terms consistent with the final conditional analysis, which has larger sample sizes. In this final analysis the power is sufficient to detect effects of odds ratios of 1.8 and above as long as the event occurs for about 20% of the sample, and 1.6 as long as the event occurs for 40% of the sample. This means that for men some significant measures of adversity in childhood (parental divorce or parental death or ill-health), and all aspects of image may not have been detected. For women the effect of some aspects of social circumstances (income, marriage, children) and some aspects of image (femininity, sociality and religiosity) may not have been detected. So in the final model one cannot rule out the possibility that childhood adversity and religiosity might have a role for men - in fact, religiosity just failed to be significant for men, or that higher income, children, femininity and religiosity might have had a role for women. Overall for men, with the exception of parental divorce, inadequate power is not an issue for this analysis, but for women it has probably underplayed the role of image, and possibly of better material circumstances being associated with more drinking.

5.9.1 Education

Education does not show a clear relationship with alcohol use at age 36 in 1982, when allowing for social circumstances and social class. For women there is no relation between 'low-risk' drinking in 1982 and educational qualifications. For men there is some relationship, but it is not consistent. Parental interest in education is associated with more risky drinking and possibly both lack of and high levels of education are associated with more 'low-risk' drinking. Change to 'low-risk drinking appears to be associated with lower cognitive potential and, possibly for women, higher education. These findings are not directly comparable with others studies as other studies do not normally allow for social circumstances and social class, and do not always consider men and women separately.

Given that the health education recommendations on drinking were not clearly stated in 1982 and were little known it is not surprising that there is little relationship between more education and 'low-risk' drinking, assuming that education mediates following health education recommendations. The fact that education unlike social class was not associated with drinking status in 1982 does suggest that education and social class might be representing different concepts. The only other reason a relationship might have been expected is from reverse causality. The more educated live longer, so assuming lifestyle has any effect on mortality their habits are likely to be those associated with reduced mortality, and subsequent health education recommendations.

These results gives some support to the view that education makes it easier for women to make recommended changes, but it is puzzling that education does not help men change and that cognitive potential is a barrier to this particular change. It could be that it is easier for women than men to change their drinking habits, because women drink less and less often, while for men having a drink at lunchtime with colleagues or going out for a drink in the evening is more part of their routine. It could be women are

more concerned with health, so that they start changing slightly sooner, However that would be in contrast to smoking where men have led the way in giving up (§4.5.4). If this was the case one would expect change by educational level to become evident over the next 10 years for both men and women, which could be investigated using the data on the NSHD at age 53.

The role of cognitive potential is unexpected. It was considered to give a better understanding of why education has an effect on behaviour, and to check it was the educational process rather than raw ability which matters. However cognitive potential has been related to drinking habits before. Some European studies have shown associations in older people between drinking slightly more and better cognitive functioning (Launer et al, 1996), (Dufouil et al, 1997). Considering cognitive potential on its own, women in the NSHD who had more cognitive potential at 8 were more likely to be drinking at more than 'low-risk' levels in 1982. There are several possible post-hoc rationalizations of this relationship. It could be that these people correctly evaluated the health education message as not very plausible. There is evidence that at a population level, current levels of consumption have a marginal effect on mortality (Britton, McPherson, 2001). Looking at it another way and assuming people enjoy alcohol these people might have the skills to arrange their lives to do so, or they might have the capacity to drink more without it affecting them; for example cognitive potential might be a general marker for physical development, and size is a factor in alcohol capacity.

5.9.2 Social Circumstances

Better material circumstances are associated with being more likely to be drinking more than the 'low-risk' level for men and women in 1982, though for men home-ownership is associated with drinking within the 'low-risk' limit. However for men home ownership interacts with social class. The pattern of interaction is that non-manual social class or home-ownership or both home-ownership and non-manual social class all have much the same effect compared with manual social class and renting. This suggests that non-manual social class and home-ownership are representing the same concept (which is probably not material circumstances) and is associated with men drinking less. On the other hand when considering those who had been 'low-risk' drinkers, at an unadjusted level, parental home-ownership was associated with women changing to more than 'low-risk' drinking and men not changing. This consistently indicates it is not the material circumstances as such which matter but what they represent and what they may lead to, i.e. income represents ability to spend on alcohol, but tenure has other meanings. There is no evidence that better material circumstances are associated with recommended change. These results are consistent with cost being a barrier to alcohol consumption (§5.5.2.1). At times of economic stress it would be seen as self-indulgent and possibly counter-productive to relieve that stress by drinking more. On the other hand higher income may represent greater opportunity to drink.

More social support is associated with men being more likely to drink over the 'low-risk' limit, probably because alcohol lubricates those relationships. This is consistent with speculations about social relationships being unlikely to be associated with healthier behaviour (§2.3.2.1). Marriage, specifically, on the other hand is associated with change towards recommended behaviour. This is consistent with other research (§5.5.2.2). Considering differences between men and women, it looks as if divorce has more effect for men than women; men who get divorced drink more, women do not. For women those who got

divorced were no more likely to change their drinking habits than those who stayed married, while those who were unmarried in 1982 were more likely to drink over the limit than those who were married in 1982 regardless of whether they got married or not. This is probably due to the age-group (36 to 43) studied and their family structure Divorced women of this age are likely to be looking after children, which cuts drinking opportunities, while divorced men are less likely to be looking after children, which could increase their drinking opportunities. For another age group or in another historic period (where men were as likely to get custody of their children as women) results could be different. Overall it suggests the underlying factor here is opportunity, (people drink if they can)

One possibility, which was not considered here in relation to alcohol use was whether type of job is related to drinking habits, and whether 'drinking' culture varies from job to job. and what effect, that has. It could be people select into jobs on the basis of the drinking culture or they change their drinking habits to suit the job. Either way it would be an example of people choosing on and acting on the basis of social acceptability, which has been operationalised in this thesis in terms of image and social trends.

5.9.3 Image

Image operated as expected Conformity, less sociability, less masculinity and religiosity were expected to be associated with drinking less and often were in prospective relationships. For men conformity, less sociability and religiosity in adolescence were associated with 'low-risk' drinking at 36, and conformity, less sociability and less masculinity at age 36 are associated with changing to 'low-risk' drinking by age 43. For women less sociability and less masculinity in adolescence were associated with 'low-risk' drinking at age 36. Religiosity is associated with 'low-risk' drinking at 36. Less sociability is associated with changing to 'low-risk' drinking. These results for women show less effect of image, than they might have done, because of lack of power. Some re-analysis with both sexes together (not reported) to increase the power confirmed that more relationships with aspects of image would have been found.

There are few other studies to compare these results with directly. However these results are consistent with studies that find religiosity or fewer social contacts associated with less alcohol use (§5.4.3). In addition image shows consistent long-range effects. Aspects of image in adolescence are associated with behaviour in adulthood as expected, independent of education, social circumstances and social class. Generally if a measure of image from adolescence is relevant to behaviour at 36, then the equivalent adult measure of image is often also relevant, which shows some internal consistency.

Although all these results are in the direction expected, the expected relationship between conformity and recommended behaviour at 36 is missing for women. It could be because of the association between conformity and upward social mobility (§3 5 2). Upwardly mobile women are likely to be more conforming. Upwardly mobile women in this cohort could be expected to drink more, taking on the characteristics of the social class they are joining, so that the effect of conformity on recommended health behaviour would be lost. That the relevant aspect of sociability is sometimes popularity is superficially very plausible; these people might well be getting more invitations out for a drink.

5.9.4 Background

In line with social trends it was expected that women from non-manual backgrounds would be more likely to drink over the 'low-risk' limit, because alcohol use is more socially accepted and has been for a longer time in the non-manual group. In the long run in Britain if alcohol use is following the same pattern as smoking, it might become less common for the non-manual groups, with men leading the trend. Non-manual background was associated with women drinking more than the 'low-risk' limit in 1982, but it was not for men. A more advantageous background (educated mother) was associated with men changing to drinking within the 'low-risk' limit, but not for women. If these represent trends one would expect non-manual women to move towards more drinking within low-risk' limit over the next 10 years, and the trend for men to become pronounced. This could be checked against the 1999 set of NSHD data, which came in too late for this thesis.

It is difficult to assess if these results are consistent with other studies as few consider social class in the light of historic trends and independent of education and social circumstances and few consider what is related to change in drinking habits. It is possible that there are also different patterns of drinking between manual and non-manual social groups. In particular, manual groups may be more likely to concentrate their drinking into a few sessions (ONS, 2000). However this should not affect the outcome used here, which is the amount drunk per week.

For the NSHD, women from a non-manual background would have been more likely to have a mother who drank alcohol, which might have made them more likely to drink (Wilson, 1980), (Parfrey, 1974), (Dight, 1976), (Green et al, 1991). However this merely indicates one way that social trends operate through the creation of social norms, which may vary by social class.

Advertisment from *Recreation and Physical Fitness for Girls and Women*, published by Departments of State and Official Bodies, Board of Education, London, 1937

6 EXERCISE

6.1 Introduction

Physical inactivity is a major factor in preventable mortality and illness, as a risk factor for heart disease and cancer (McGinnis, Foege, 1993). During the lifetime of the NSHD members' attitudes to physical activity have changed. In their childhood, physical education at school was not particularly concerned with health (Randall, 1955), (Williams, 1987). Nor was it seen as a particularly interesting or important part of people's lives. Some contemporary social surveys covering the period barely consider it, (Rowntree, Lavers, 1951), (Carr-Saunders et al, 1958), or only see leisure exercise in the context of keeping fit (Sillitoe, 1969) not for any preventative purpose. Sports promotion did become more prominent during this period, with the setting up of the advisory Sports Council in 1966 (Holt, Mason, 2000). However decreasing energy intakes and increasing obesity (Charlton, Murphy, 1997), (Prentice, Jebb, 1995) do not suggest activity levels are increasing. So, it is useful to try to understand why this is happening, in the light of health education advice to be more active.

6.2 Hypothesis

The hypothesis is discussed in chapter 3.6.1 and shown in figure 3.1.

6.3 Health Education Message

Promotion of physical activity has taken place throughout the 20th century in Britain, for various reasons; ensuring there was a fit and strong workforce and army, keeping youth out of trouble, keeping up with continental trends in the 1930s, being a more attractive and desirable borough in the 1970s (Gratton, Taylor, 1991), (Welshman, 1996). Specific evidence on the role of physical activity in preventing disease accumulated in the post war period (Morris, Heady, 1953), (Morris et al, 1973), (Cooper et al, 1976), (Paffenbarger et al, 1978), and the case for exercise was made in the late 1970s (Fentem, Bassey, 1978). Promotion of physical activity was part of the general move towards personal responsibility for health from the late 1970s onwards (Berridge, 1999). However, specific governmental advice was vague (DoE, 1975), without clear targets on physical activity levels (DoH, 1992). Nevertheless, from the late 1970s onwards the Health Education Council was responsible for several exercise-related promotional campaigns, such as fun runs (Rees, 1980), (Linthwaite, 1985) as part of the national 'Look After Yourself!' campaign (Sports Council, 1981).

During the 1980s surveys found most people had some idea of the benefits of exercise (Shewry et al, 1990), (Rayner et al, 1990), (Davison, 1980), (Philipp et al, 1988) though the questions were couched in vague terms. However the message on physical activity was not very clear, nor was it very clear exactly what to do, or how to check one had done the right amount of exercise, so it would have been easy to think that whatever activity one was doing was enough, as was found in the 1980s (Davison, 1980), (Rayner et al, 1990).

6.4 Outcome

This thesis is about health behaviour in the context of public health messages. The emphasis is on understanding why people follow pubic heath messages, not on detailing who lives an optimum life-style for health. So the criteria for selecting an outcome is what the NSHD members might reasonably have been expected to have understood they were supposed to do, not what is the optimum level of physical activity for health (if known). Given the lack of clarity on the health education message in the 1980s, and the fact that in the health education world in the 1980s leisure exercise was seen as more important than occupational activity (Maryon Davis, 1987) a simple broad outcome measure, of whether the study member was taking any leisure exercise at all has been used. In 1982 (at age 36), the study members were asked about the frequency and duration of a range of active leisure pursuits in the preceding month, and about their other activities during the day. NSHD members were classified as taking part in leisure exercise if they reported any participation in sports and recreational activities in the previous month; otherwise, they were classified as not taking leisure exercise. Participation in leisure exercise was classified in the same way in 1989 (at age 43). However, leisure exercise may be the reflection of having a sedentary job, and as such be a marker for a middle-class lifestyle. Differences between social classes may be reduced by taking into account other physical activity (Salmon, 2000), (Lakka et al, 1996). So the moderating effect of other physical activity undertaken as part of daily life, such as activity in getting to work and at work, DIY, gardening or housework, is also considered.

6.5 Previous Research

The definition and assessment of physical activity in epidemiological research is not standradised (Lee, 1993). Of necessity this discussion considers physical activity in any form, even though the measures used may not be directly comparable. Participation rates decline with age (Sillitoe, 1969), (Stephens, 1987). So, it can be difficult to compare surveys looking at different age groups, unless they are adjusted for age.

6.5.1 Education

For women, there is a strong link between education and exercise. One of the arguments used in the late 19th century against education for women was that too much brain activity in adolescence would ruin their health and procreative potential (McCrone, 1990), (Bullough, Voght, 1973). Promoting girls' physical activity was a way of countering this argument, and was done by the early educational institutions for women e g. Oxford and Cambridge women's colleges (McCrone, 1986), and pioneering schools for girls such as North London Collegiate, St Leonard's, Wycombe Abbey or Roedean (Atkinson, 1985). Promoting physical activity became a core aspect of these schools and was immortalised in popular culture by things like the Mallory Towers books.

One would expect education to be associated with more physical activity, and changing to more physical activity. One might also expect it to be more important for women than men, because of the way it was promoted by the pioneering educational establishments for women.

Education is consistently associated with taking exercise throughout life. Adolescents with more education or higher educational aspirations take more exercise (Karvonen, Rimpela, 1996), (Bungum, Vincent,

1997). Better-educated adults are more active (Crespo et al, 2000), (Bennett, 1995), (Stronegger et al, 1997), (Pomerleau et al, 2000), (Uitenbroek et al, 1996). However, education does need to be separated out from the other aspects of SES status, i.e. material circumstances and social class, which few studies have the breadth of data to do.

6.5.2 Social Circumstances

6.5.2.1 Material Circumstances

Cost is perceived to be a barrier to exercise by potential participants (Chinn et al, 1999), (Rayner et al, 1990). Greater material deprivation is generally associated with being less active (Crespo et al, 1999), (Drommers et al, 1996), (Sillitoe, 1969), (Bartley et al, 1999), (Pomerleau et al, 2000). However, few studies have the data to establish the role of material conditions independent of education and social class.

6.5.2.2 Social Support

Social support is associated with being more active (Carron et al, 1996), (Wilcox et al, 2000), (Eyler et al, 1999), (Trost et al, 1999). Marriage is sometimes associated with men being more likely to be active (Crespo et al, 2000), but not always completely consistently (Lakka et al, 1996). For women, marriage makes no difference (Crespo et al, 2000). Women cite childcare and lack of time as a barrier (Booth et al, 1997), (Rayner et al, 1990), (Sternfeld et al, 1999), (Sillitoe, 1969). Participation is more likely if parents, siblings and friends do so (Wold, Anderssen, 1992). In general, social networks, such as friends and family, may make it easier to exercise, but these also provide constraints for women.

6.5.2.3 Stress

It is generally accepted that physical activity improves mental state (Fox, 1999), (Dilorenzo et al, 1999). Whether stress, anxiety or depression is a barrier to physical activity is less clear. It is plausible, but the evidence is mixed (Milligan et al, 1997), (Kivela, Pahkala, 1991), (Cohen et al, 1991), (Kavussanu, McAuley, 1995). If there is a relationship it needs to be clarified in relation to circumstances that might have caused the stress, such as lack of money. One study found that those in more rewarding jobs are more likely to exercise (Hellerstedt, Jeffery, 1997), but there does not seem to be much relation between other stressors at work, such as job insecurity and physical activity (Ferrie et la, 1995), (Kivimaki et al, 2000).

In line with previous investigations and for consistency with the other health behaviours studied, stress (measured by depression) is considered as a potential barrier to exercise. The evidence that stress is a barrier to exercise is not very strong.

6.5.3 Image

Considering sport and exercise in terms of self-presentation and self-identity has been suggested before (Leary, 1992). There are some very obvious lay manifestations, such as the gendered nature of some physical activities, for example dancing or weight lifting. There are also other aspects. 'Sport is a cultural artefact which, more often than not, both determines and reflects the dominant values in society. Furthermore it is replete with rituals and symbols which are, in turn, powerful and elaborate mechanisms of social integration, consolidation and domination' (Mangan, 1989)

6.5.3.1 Conformity

By definition, most sport predicates a willingness to adhere to a set of rules. Participation in sport is conventional behaviour, especially for men. For example, 60% of young men reported participating in some sort of sport in the early 1980s (OPCS, 1985). So one would expect the more conventional to be doing more physical activity. Physical activity is not often considered from this perspective; though it has been observed that more conventional adolescents (using a very broad definition of conventionality, including church-going) are more physically active (Donovan et al, 1991).

6.5.3.2 Sociability

Traditionally sport is seen as a social activity. 'One of the most important characteristics of modern sport is its ability to provide and institutionalize a framework of sociability' (Eisenberg, 1990). Women may see leisure exercise as a social activity (Sillitoe, 1969), so one would expect the more social to be participating more. Studies have found the physically active more social (Vilhjalmsson, Thorindsson, 1998), or girls taking part in team sports more friendly and competitive (Ryckman, Hamel, 1992). A previous study of the NSHD (Kuh, Cooper, 1992) found a high level of activity associated with extraversion.

6.5.3.3 Gender-identity

Those setting up sporting associations had gender on the agenda. Those setting up the Amateur Athletic Association in 1880 explained 'it is the competition of equally matched antagonists which brings out all the manly qualities of the Englishman, and that this alone is the true raison d'etre of athletic sports' (Eisenberg, 1992). This image has largely remained intact (Walvin, 1984), and is expressed in reasonably contemporary social surveys for the NSHD members. 'Women's interests in active sport are almost exclusively confined to early youth and much more, of course, to single girls than married women... The interest in sport centres around those activities where social contacts are the primary attraction... women prefer small things to play with, where less physical exertion is needed..' (Zweig, 1952). Reasonably, contemporary handbooks on physical education are concerned about what girls should do (Munrow, 1972). Whilst excellence in sport is seen as highly desirable for men, and adding to their allure, it is less clear it is desirable for women, challenging as it does women's role as the 'weaker' sex and popular images of femininity (McCrone, 1988), (Lenskyj, 1986) (Nelson, 1994). 'Pin-up' images of women for this generation do not feature muscles or physical strength. In addition some of the historical reasons for promoting physical activity might be seen to be of less relevance to women: ensuring a fit army, keeping youth out of trouble, or even being character forming for ruling an empire. However this emphasis has remained. Professional sport is largely a male preserve. Public provision is slanted towards traditionally male sports (Sillitoe, 1969) Sports psychology contains papers checking whether girls who excelled at sport were exhibiting 'undesirable male' characteristics (Colker, Widom, 1980), and finds them less feminine (Colker, Widom, 1980) (Hochstetler et al, 1985). Evidence of these strong gender images remains today. A study in New York found male adolescent athletes enjoying more of the sexual action, and female ones less (Miller et al, 1998). One would expect someone who saw himself or herself as more masculine to be more likely to participate in physical activity. Participation in physical activity is not usually considered from this perspective and there is no evidence on this point.

6.5.3.4 Religiosity

There are long-standing associations between religious movements and the promotion of sports, popularly perceived as motivated by a desire to distract youth from too much physical activity with the opposite sex. There is a tradition of 'muscular Christianity', and several of the prominent Christian associations and movement promote sports, e.g. Boys Brigade or Boy Scouts (McLeod, 1996). Many religions contain traditions of self-denial or even self-punishment and for many people that may well be how physical activity appears to be.

Physical activity is not usually considered from this perspective. Nevertheless there is clear evidence of religiosity (measured by attendance) predating increases in leisure exercise in the Tecumseh Community Health study (Strawbridge et al, 1997).

6.5.4 Social Trends/Background

Historically sports and pastimes were used as public exhibitions of exclusiveness and power, privilege and status, for example hunting (Malcolmson, 1984). By definition, much sport has been associated with privilege, only the privileged had the money, energy and leisure to do it. There is very little quantative historic evidence on participation in leisure exercise. However there are some strands of evidence, which suggest that there is a consistent long-term trend to greater participation by the non-manual groups.

In the early 20th century children from non-manual groups were better fed, had a better chance of access to facilities and activities that are more interesting. Private schools, no doubt as part of their cult of classicism, had a strong tradition of games playing as a 'character forming' exercise, allowed by the schools facilities and in some cases by the structure of the 'boarding school day'. In contrast, state schools focused more on the health promoting effects of drill or 'Swedish gymnastics' (Guttman, 1994), (Williams, 1987). However until World War 2 provision of physical education in state schools was patchy and bedevilled by lack of facilities, lack of suitable footwear and worries over the ability of poorly fed children to cope with physical exertion (Welshman, 1996).

Participation in some of the newer leisure activities, such as rambling, was led by non-manual groups (Walker, 1985). For women in the interwar period there was working-class hostility to women's sports, while social golf and social tennis were the mainstay of some non-manual women's lives (McKibben, 1998). Trickle down of leisure activity from higher SES groups has been impressionistically described (Gratton, Taylor, 1991), (Walker, 1985).

Old medical ideas on the importance of rest and avoiding physical strain (Liddiard, 1944), (Stote, 1936) may also have dissuaded more traditional groups from participating. There is some evidence that people have seen 'physical stress' as causing illness (Moynihan et al, 1980), and others that 'Sleep and Relaxation' were seen as school health education topics in the 1970s (Langmaid, 1978).

So one would expect greater participation among the higher SES groups. A previous study of the NSHD found those exercising at 36 had better educated mothers (Kuh, Cooper, 1992). Exercise in adolescence is usually associated with higher parental socio-economic status (Tuinstra et al, 1998), (Leino et al, 1996),

(Vilhjalmsson, Thorindsson, 1998) though sometimes not always consistently for boys and girls (Leino et al, 1996). Exercise in adults is often related to higher parental SES (van Mheen, 1998), (Lynch et al, 1997).

Participation in adulthood is generally higher in non-manual social classes (Sillitoe, 1969), (Bartley et al, 1999), (OPCS, 1976), (OPCS, 1985), (OPCS, 1992), (Blane et al, 1996). However, there are places where no relationship is observed, for example contemporary Spain (Borrell et al, 2000), or times when the relationship disappears when adjusted for occupational activity (Salmon et al, 2000). Few studies have the data to establish the role of social class independent of material conditions, education and occupational activity

6.6 Measures

Measures used for explanatory categories are described in general in chapter 3 and in detail in Appendix A. In keeping with the hypothesis (§3.6.1) they are considered in four categories; education, social circumstances, image and background. However, when considering leisure exercise there is the possible moderating effect of activity as part of daily life and physical disability. These have also been considered. In 1982, information was collected from the NSHD members on three other measures of physical activity apart from leisure exercise to capture all other aspects of physical activity. These are activity during the working day, heavy gardening and DIY, and cycling and walking to work or otherwise. Activity during the working day was classified into none, for more than half the day sitting down, and some for less than half the day sitting. Heavy gardening and DIY were classified as none, if none reported in the last month, and some if any reported. Cycling and walking to work or in leisure time was classified as none if they did not normally walk or cycle to work or do so in leisure time, and some if they had done so. Physical disability was asked about in 1989.

6.7 Missing data

Missing data is discussed in chapter 3.6.4. In the adjusted analyses presented below the data used has almost exactly the same social composition as the original sample, though it contains about half the NSHD members.

6.8 Results

Table 6-1: Participation in leisure exercise at age 36 and 43 -weighted

	Women		Men	
	%	N	%	N
Any participation in Leisure exercise at age 36 in 1982	56%	1663	67%	1646
Start any leisure exercise between ages 36 and 43	24%	626	28%	454
Stop any leisure exercise between ages 36 and 43	43%	873	40%	1028
Any participation in leisure exercise at age 43 in 1989	41%	1627	49%	1635

Table 6.1 shows who was taking leisure exercise in 1982 and who changed between 1982 and 1989. The participation rates are weighted to allow for the sample stratification. Because of the very broad definition of leisure exercise, these participation rates are higher than others have found on definitions closer to what

is necessary for health. In line with the gendered nature of exercise men had higher participation rates at age 36, were slightly less likely to give up leisure exercise and slightly more likely to start. The overall decline in leisure exercise is consistent with a decline in participation rates with age.

6.8.1 Leisure exercise at 36

6.8.1.1 Unadjusted relationships

Table 6.2 shows the childhood and adolescent measures associated with taking leisure exercise at age 36, grouped into the categories previously discussed, i.e. education, social circumstances, image and background. Most measures are related to leisure exercise at 36 in the expected direction. Leisure exercise is associated with more education, better childhood social circumstances, higher childhood social class and parental education and those individually exhibiting more conformity, sociability, masculinity and religiosity.

One of the difficulties with re-using existing data is that sometimes the measures available are only approximations, or conflate two different concepts, or imply a different hypothesis. In this case, two of the measures of childhood social support - Goes to clubs at 13 or 15 – are also a measure of childhood sports participation, as some of these were sports clubs. Including these measures in an adjusted model brings in childhood sport participation as associated with adult leisure activity. However, the hypothesis is concerned with what leads to sport participation, not whether there is tracking over the life course. Including sports participation in childhood potentially obscures the underlying reasons for leisure exercise in adulthood. Given there are other measures of social support in childhood, such as interests with friends, these measures were included but for clarity adjusted to remove going to sports clubs.

Table 6.3 shows the relationship between the categories and participation in sport at 36. As with the childhood measures, those with more education, better social circumstances and non-manual background and some aspects of image are more likely to be participating. However, the social circumstances appear to be less important for women than for men.

Table 6-2. Childhood/Adolescent measures and leisure exercise status at 36 - unadjusted

		WOMEN				MEN			
		No leisure exercise	Some leisure Exercise	N		No leisure exercise	Some leisure Exercise	N	
Education									
Cognitive potential above av.	Yes	**36%**	**64%**	**854**		**26%**	**74%**	**807**	
	no	**51%**	**49%**	**643**	**P<.00001**	**37%**	**63%**	**653**	**P<.00001**
Left school at 16, or 16+	No	**49%**	**51%**	**885**		**38%**	**62%**	**858**	
	yes	**34%**	**66%**	**718**	**P< 00001**	**23%**	**77%**	**737**	**P<.00001**
Parents interested in primary school	No	**48%**	**53%**	**666**		**35%**	**65%**	**728**	
	yes	**39%**	**61%**	**765**	**P < .01**	**29%**	**71%**	**706**	**P < .05**
Social Circumstances									
Material circumstances									
Parents own home @ 4	Yes	**37%**	**63%**	**437**		**30%**	**70%**	**414**	
	no	**45%**	**55%**	**1140**	**P < .01**	**32%**	**68%**	**1143**	**P <.01**
Parents own home @ 15	Yes	**38%**	**62%**	**589**		**27%**	**73%**	**571**	
	no	**47%**	**53%**	**860**	**P <.001**	**34%**	**66%**	**865**	**P <.01**
Social Support									
Parental divorce	Yes	43%	57%	128		33%	67%	132	
	No	42%	58%	1534	Ns	31%	69%	1513	Ns
Parents alive and well	No	48%	52%	228		33%	67%	219	
	Yes	42%	58%	1215	P<.1	31%	69%	1214	Ns
Interests with parents	Yes	**42%**	**58%**	**1169**		30%	70%	1008	
	No	**50%**	**50%**	**277**	**P<.05**	33%	67%	443	Ns
Interests with peers	Yes	**41%**	**59%**	**1217**		**30%**	**70%**	**1257**	
	No	**52%**	**48%**	**228**	**P<.005**	**40%**	**60%**	**193**	**P<.005**
Goes to non-sports clubs at 13	Yes	42%	58%	591		29%	71%	559	
	No	44%	56%	855	ns	33%	67%	892	ns
Goes to non-sports clubs at 15	Yes	41%	59%	763		**28%**	**78%**	**643**	
	No	46%	54%	650	P< 1	**34%**	**66%**	**775**	**P<.01**
Stress									
Childhood anxiety depression	Yes	**58%**	**42%**	**199**		**49%**	**51%**	**86**	
	no	**42%**	**58%**	**1011**	**P<.0001**	**30%**	**70%**	**1135**	**P<.001**
Image									
Conformity									
Conforms at 13	Yes	**41%**	**59%**	**1125**		30%	70%	1032	
	No	**50%**	**50%**	**300**	**P < .01**	35%	65%	391	P < .1
Conforms at 15	Yes	42%	58%	1073		**29%**	**71%**	**1011**	
	No	48%	52%	340	P < .1	**38%**	**62%**	**405**	**P < .01**
Works badly at school at 13	No	43%	57%	1338		**30%**	**70%**	**1277**	
	yes	42%	58%	100	Ns	**41%**	**59%**	**159**	**P<.01**
Works badly at school at 15	No	**42%**	**58%**	**1311**		**30%**	**70%**	**1248**	
	yes	**53%**	**47%**	**109**	**P<.05**	**42%**	**58%**	**175**	**P<.01**
Sociability									
Very popular at 13	Yes	38%	62%	174		**21%**	**79%**	**211**	
	no	44%	56%	1275	P<.2	**33%**	**67%**	**1235**	**P < .001**
Makes friends very easily at 13	Yes	**36%**	**64%**	**214**		**23%**	**77%**	**240**	
	no	**44%**	**56%**	**1225**	**P<.05**	**33%**	**67%**	**1189**	**P<.005**
Makes friends very easily at 15	Yes	38%	62%	244		30%	70%	239	
	no	44%	56%	1164	P<.1	32%	68%	1175	Ns
Gender-identity									
Exhibits feminine behaviour at 13	Yes	**48%**	**52%**	**444**		**41%**	**59%**	**359**	
	no	**40%**	**60%**	**930**	**P<.01**	**28%**	**72%**	**1051**	**P<.00001**
Exhibits feminine behaviour at 15	Yes	**49%**	**51%**	**488**		**37%**	**63%**	**386**	
	no	**40%**	**60%**	**881**	**P <.01**	**29%**	**71%**	**1012**	**P <.01**
Religiosity									
Religious upbringing	yes	**41%**	**59%**	**1337**		**30%**	**70%**	**1240**	
	no	**48%**	**52%**	**325**	**P < .05**	**36%**	**64%**	**405**	**P < .05**
Goes to Sunday school at 11	Yes	43%	57%	1250		**28%**	**72%**	**1122**	
	No	44%	56%	229	Ns	**41%**	**59%**	**350**	**P < .0001**
Background									
Father non-manual at 4	Yes	**33%**	**67%**	**637**		**27%**	**73%**	**626**	
	No	**49%**	**51%**	**891**	**P < .0001**	**34%**	**66%**	**894**	**P < .01**
Father non-manual at 15	Yes	**37%**	**63%**	**581**		**26%**	**74%**	**598**	
	No	**47%**	**53%**	**761**	**P < .0001**	**36%**	**64%**	**720**	**P < .001**
Mother went to secondary school	Yes	**35%**	**65%**	**539**		**27%**	**73%**	**576**	
	No	**48%**	**52%**	**952**	**P < .00001**	**34%**	**66%**	**901**	**P < .01**
Father went to secondary school	Yes	**33%**	**67%**	**618**		**26%**	**74%**	**644**	
	No	**50%**	**50%**	**863**	**P < .00001**	**35%**	**65%**	**814**	**P < .001**

Table 6-3: Adult measures and leisure exercise status at 36 - unadjusted

		WOMEN				MEN			
		No leisure exercise	Some leisure exercise	N		No leisure exercise	Some leisure exercise	N	
Education									
Has O levels or more	No	**48%**	**52%**	**1153**		**35%**	**65%**	**924**	
	yes	**27%**	**73%**	**432**	**P<.00001**	**25%**	**75%**	**644**	**P<.00001**
Spouse with qualifications	Yes	**37%**	**63%**	**803**		**28%**	**72%**	**653**	
	No	**49%**	**51%**	**751**	**P<.001**	**34%**	**66%**	**943**	**P<.05**
Spouse left school at 16, or 16+	Yes	**34%**	**66%**	**696**		**27%**	**73%**	**833**	
	No	**44%**	**52%**	**928**	**P<.001**	**36%**	**64%**	**789**	**P<.001**
Social circumstances									
Material circumstances									
Home ownership	Yes	**37%**	**63%**	**1245**		**28%**	**72%**	**1226**	
	No	**59%**	**41%**	**418**	**P < .0001**	**39%**	**61%**	**416**	**P < .0001**
Low income or none (own)	Yes	43%	57%	1029		**38%**	**62%**	**795**	
	No	40%	60%	513	ns	**24%**	**76%**	**767**	**P<.00001**
Adequate income	Yes	**40%**	**60%**	**1327**		**29%**	**71%**	**1287**	
	No	**51%**	**49%**	**303**	**P<.001**	**39%**	**61%**	**345**	**P<.001**
Go without - lack of money	Yes	**51%**	**49%**	**259**		**40%**	**60%**	**247**	
	No	**41%**	**59%**	**1383**	**P<.005**	**30%**	**70%**	**1384**	**P<.005**
Social support									
Married	Yes	42%	58%	1418		**30%**	**70%**	**1366**	
	No	44%	56%	245	Ns	**36%**	**64%**	**280**	**P < .05**
Children at home	No	46%	54%	243		35%	65%	451	
	Yes	42%	58%	1420	ns	30%	70%	1195	P<..2
Member of clubs, etc	No	**52%**	**48%**	**881**		**46%**	**54%**	**658**	
	Yes	**32%**	**68%**	**780**	**P<.001**	**22%**	**78%**	**986**	**P<.001**
Employed or housewife	Yes	42%	58%	1500		**30%**	**70%**	**1541**	
	No	43%	57%	149	Ns	**52%**	**48%**	**94**	**P < .0001**
Stress									
Depressive Symptoms	Yes	47%	53%	141		**43%**	**74%**	**61**	
	No	42%	58%	1509	P<.2	**31%**	**69%**	**1575**	**P<.05**
Image									
Sociability									
Friends round weekly or more	Yes	**37%**	**63%**	**593**		**27%**	**73%**	**466**	
	No	**45%**	**55%**	**1057**	**P<.001**	**33%**	**67%**	**1169**	**P<.05**
Gender-identity									
In male dominated occupation	Yes	38%	62%	162		30%	70%	1380	
	No	43%	57%	1493	Ns	34%	66%	257	ns
Religiosity									
Takes part in religious activities	Yes	**32%**	**68%**	**496**		26%	74%	291	
	no	**47%**	**53%**	**1159**	**P <.00001**	32%	68%	1354	P <.1
Has religious belief at 36	yes	**41%**	**59%**	**1154**		30%	70%	891	
	no	**46%**	**54%**	**470**	**P < .05**	33%	67%	718	ns
Background									
Social class non-manual	Yes	**38%**	**62%**	**705**		**24%**	**76%**	**893**	
	No/other	**46%**	**54%**	**942**	**P < .005**	**40%**	**60%**	**734**	**P < .00001**

6.8.1.2 Adjusted analysis

A stepwise model selection procedure was used to determine how much influence each of these measures might have on leisure exercise when considered together, as described earlier (§3.6.6). When considering leisure exercise the adulthood measure of social support; i e. membership of clubs and associations is not ideal, because it may be membership of sports clubs, and may be saying that those who go to sports clubs are more likely to take leisure activity It has not been excluded, but it may overstate the effect of social support in adulthood.

Table 6.4 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with leisure exercise for women and men, allowing for other physical activity at 36 (walking to work, cycling to work, DIY, gardening and such like), and disability. Those who are more active in daily life are more likely to take leisure exercise, but men taking exercise as part of their job and those with a physical disability are less likely to. Whether these measures were included or not makes little difference. They are included, but for simplicity, they are not shown. Only the significant measures relevant to the hypothesis are shown. Table 6.4 shows two models, one showing the childhood and adolescent measures associated with leisure exercise at 36 (labelled Child), and the other showing childhood, adolescent and adult factors (labelled Child + Adult).

Table 6-4: Odds ratios and confidence intervals for measures significantly associated with taking leisure exercise at 36 in 1982, allowing for exercise as part of daily life and disability.

		Women		Men	
		Child	Child & Adult	Child	Child & Adult
Education					
Cognitive potential above av.	Yes	1 7*** (1.34-2 23)			
	No	1			
Left school at 16, or 16+	No			1 6** (1.19-2 09)	1 5* (1.11-1 99)
	Yes			1	1
Has O levels or more	Yes		1 6** (1.14-2 18)		
	No		1		
Social Circumstances					
Owns own home	Yes		1 9*** (1 41-2 58)		
	No		1		
Adequate income	Yes				1.5* (1.07-2 01)
	No				1
Interests with peers at 13	Yes			1 4* (1 01– 2.07)	
	No			1	
Member of clubs, etc at 36	Yes		1 8*** (1 39-2 33)		2.7*** (2 09-3.54)
	No		1		1
Image					
Sociability					
Very friendly at 13	Yes	1 6* (1.08-2 24)	1.6* (1.12-2 37)	1 5* (1.01-2 10)	1.5* (1 00-2 12)
	No	1	1	1	1
Gender-Identity					
Exhibits feminine	No			1 6** (1.20-2.12)	1.6** (1 17-2 09)
behaviour at 13	Yes			1	1
Religiosity					
Goes to Sunday school at 11	Yes			1 5* (1 12-2.00)	1 6** (1.16-2.10)
	No			1	1
Takes part in religious	Yes		1 5* (1 10-1 95)		
activities at 36	No		1		
Background					
Father non-manual and	yes	1 9*** (1 45-2 58)	1 4* (1 05-1 97)		
has secondary education	No	1	1		
N		1136	1128	1212	1213
chi squared		54 6	104 1	45 9	104 3
Df		3	6	5	6
Nagelkerke r square		061	115	042	111

* P < 05 ** P < 005, *** P < 0005

In a multiple regression model for men the adolescent measures associated with leisure exercise at 36 are more education, the social support aspect of social circumstances, and most aspects of image in the expected direction, i e. the more sociable, masculine and religious. There is an interaction between the measure of social support and masculinity Inspection of the interaction reveals that both masculinity and social support are both required for participation. No aspect of background is relevant. Adding in adult measures hardly changes the overall picture. The adult measure for social support replaces the adolescent

one, and some aspects of material circumstances – home ownership and enough income – are now significant. The other measures of sociability, gender and religiosity remain Social class is not significant and makes little difference if added in There is an interaction between education and religiosity Inspection of the interaction shows that both education and religiosity are required for leisure exercise.

In a multiple regression model for women leisure exercise is associated with adolescent education, the sociability aspect of image and background. Gender-identity and conformity came close to being significant, as did the social support aspect of social circumstances. Religiosity does not feature. When adult measures are also considered, some aspects of current social circumstances, i.e. social support and material circumstances are significant as well. The significant background measure concerns the family of origin, not the spouse's social class. Father's social class and educational level were elided into one measure, because both just failed to be significant, but it would be inappropriate to conclude family of origin was irrelevant in those circumstances. Spouse's social class is not significant, and has little effect on anything else. There is an interaction between father's social class and education and home ownership. Inspection of the terms of the interaction show that coming from a non-manual family or adult home-ownership is enough for exercise, suggesting they may both be measuring the same underlying factor. Overall, almost all the categories in the hypothesis, education, social circumstances, image and background are contributing to explaining adult leisure exercise.

Comparing the adult models for men and women (using a model containing all the significant measures for men and women, plus sex), the main differences are that gender-identity features for men but not women, and background features for women but not men. Gender-identity came close to significance for women. Background is operating differently for men and women as it interacts with sex in a combined model.

6.8.2 Starting leisure exercise between 36 and 43

6.8.2.1 Unadjusted relationships

Table 6.5 shows the childhood and adolescent measures associated with starting leisure exercise between 36 and 43. These people took heed of the health education message. For women education, parental material circumstances, social support and background are associated with starting leisure exercise. For men the conformity aspect of image and background are associated with starting.

Table 6-5: Childhood/Adolescent measures and starting leisure exercise between 1982 and 1989 - unadjusted

		WOMEN				MEN			
		Start	Do not start	N		Start	Do not start	n	
Education									
Cognitive potential above av.	Yes	29%	71%	277		34%	64%	196	
	no	26%	74%	290	Ns	26%	74%	208	P< 2
Left school at 16, or 16+	No	**21%**	**79%**	**377**		28%	72%	285	
	yes	**36%**	**64%**	**228**	**P<.00005**	33%	67%	158	P<.2
Parents interested in primary school	No	**20%**	**80%**	**288**		30%	30%	218	
	yes	**35%**	**65%**	**259**	**P<.0001**	70%	70%	182	Ns
Social Circumstances									
Material circumstances									
Parents own home @ 4	Yes	**38%**	**62%**	**144**		33%	67%	110	
	No	**24%**	**76%**	**453**	**P < .01**	30%	70%	327	Ns
Parents own home @ 15	Yes	**36%**	**64%**	**203**		33%	67%	143	
	No	**22%**	**78%**	**353**	**P <.001**	28%	62%	258	ns
Social support									
Parental divorce	Yes	24%	76%	50		38%	62%	34	
	No	27%	73%	575	Ns	29%	71%	420	Ns
Parents alive and well	No	26%	74%	99		**18%**	**82%**	**62**	
	Yes	27%	73%	455	Ns	**32%**	**68%**	**339**	**P<.05**
Interests with parents	Yes	28%	72%	447		29%	71%	335	
	No	25%	75%	107	Ns	36%	64%	69	Ns
Interests with peers	Yes	29%	71%	430		30%	70%	271	
	No	23%	77%	124	Ns	31%	69%	133	Ns
Goes to non-sports clubs at 13	Yes	**33%**	**67%**	**224**		**40%**	**60%**	**147**	
	No	**24%**	**76%**	**330**	**P<.05**	**25%**	**75%**	**257**	**P<.005**
Goes to non-sports clubs at 15	Yes	32%	68%	282		32%	69%	160	
	No	24%	76%	264	P<.1	29%	71%	234	Ns
Stress									
Childhood anxiety depression	Yes	**16%**	**84%**	**62**		18%	81%	37	
	No	**29%**	**71%**	**367**	P<.05	31%	69%	367	P<.2
Image									
Conformity									
Conforms at 13	Yes	27%	73%	414		33%	67%	282	
	No	28%	72%	133	Ns	24%	76%	114	P < .1
Conforms at 15	Yes	28%	72%	404		32%	68%	265	
	No	27%	73%	137	Ns	26%	74%	131	Ns
Works badly at school at 13	No	18%	82%	519		32%	68%	345	
	yes	28%	72%	35	Ns	22%	78%	55	P< 2
Works badly at school at 15	No	24%	76%	499		30%	70%	335	
	yes	28%	72%	46	Ns	26%	74%	62	Ns
Sociability									
Very popular at 13	Yes	36%	64%	59		37%	63%	41	
	no	26%	74%	498	P<.2	29%	71%	363	Ns
Makes friends very easily at 13	Yes	36%	64%	63		38%	62%	50	
	no	26%	74%	487	P<.1	29%	71%	346	Ns
Makes friends very easily at 15	Yes	26%	74%	78		27%	73%	64	
	no	28%	72%	464	Ns	30%	70%	328	Ns
Gender-identity									
Exhibits feminine behaviour at 13	Yes	23%	77%	188		27%	73%	132	
	No	29%	71%	335	P<.2	32%	68%	263	Ns
Exhibits feminine behaviour at 15	Yes	25%	75%	214		32%	68%	123	
	No	29%	71%	315	Ns	29%	71%	265	Ns
Religiosity									
Religious upbringing	Yes	27%	73%	495		29%	71%	330	
	No	25%	75%	130	Ns	34%	66%	124	Ns
Goes to Sunday school at 11	Yes	28%	72%	485		30%	70%	285	
	No	22%	78%	81	Ns	27%	73%	126	Ns
Background									
Father non-manual at 4	Yes	**36%**	**64%**	**156**		**37%**	**63%**	**153**	
	No	**23%**	**77%**	**420**	**P < .001**	**27%**	**73%**	**268**	**P < .05**
Father non-manual at 15	Yes	32%	68%	194		36%	64%	138	
	no	25%	75%	314	P < .1	28%	72%	233	Ns
Mother went to secondary school	yes	**35%**	**65%**	**405**		**39%**	**61%**	**142**	
	no	**24%**	**76%**	**168**	**P < .01**	**25%**	**75%**	**265**	**P < .01**
Father went to secondary school	yes	31%	69%	387		**40%**	**60%**	**152**	
	no	26%	74%	179	Ns	**24%**	**76%**	**250**	**P < .001**

Table 6.6 shows the adult measures at age 36 associated with starting leisure exercise between 36 and 43. For women the adult measures of the same categories, i.e. education, social circumstances and background are associated with starting leisure exercise, as were the adolescent measures. In addition, religiosity is also significant. For men adult measures bring in education, and social circumstances, as well as background. For men it is not their own education, which is significant, but their spouse's.

Table 6-6: *Adult measures at age 36 and starting leisure exercise between 36 and 43* - unadjusted

		WOMEN				MEN			
		Start	Do not start	n		Start	Do not start	N	
Education									
Has O levels or more	No	**22%**	**78%**	**488**		28%	72%	285	
	yes	**53%**	**47%**	**108**	**P<.00001**	34%	66%	146	ns
Spouse with qualifications	Yes	**35%**	**65%**	**267**		**41%**	**59%**	**169**	
	No	**20%**	**80%**	**321**	**P<.0005**	**23%**	**77%**	**275**	**P<.0005**
Spouse left school at 16, or 16+	Yes	**42%**	**58%**	**218**		**38%**	**62%**	**205**	
	No	**19%**	**81%**	**390**	**P<.0005**	**24%**	**76%**	**245**	**P<.001**
Social circumstances									
Material circumstances									
Owns own home	Yes	**32%**	**68%**	**410**		**36%**	**64%**	**318**	
	No	**17%**	**83%**	**216**	**P < .0001**	**16%**	**84%**	**134**	**P < .0001**
Low income or none (own)	Yes	**24%**	**76%**	**289**		26%	74%	443	
	No	**41%**	**59%**	**165**	**P<.001**	29%	71%	183	Ns
Adequate Income	Yes	28%	72%	473		30%	70%	335	
	No	25%	75%	139	Ns	30%	70%	113	Ns
Go without - lack of money	Yes	22%	78%	116		26%	74%	78	
	No	28%	72%	503	Ns	32%	68%	370	ns
Social support									
Married	Yes	28%	72%	530		**32%**	**68%**	**370**	
	No	21%	79%	96	P< 2	**20%**	**80%**	**84**	**P < .05**
Children at home	No	20%	80%	99		27%	73%	135	
	Yes	28%	72%	527	P<.2	31%	69%	319	ns
Member of clubs, etc	Yes	**34%**	**66%**	**227**		29%	71%	195	
	No	**22%**	**78%**	**398**	**P<.005**	31%	69%	295	Ns
Employed or housewife	Yes	**28%**	**72%**	**563**		**32%**	**68%**	**407**	
	No	**15%**	**85%**	**85**	**P < .1**	**10%**	**90%**	**40**	**P < .01**
Stress									
Depressive Symptoms	Yes	25%	75%	59		19%	81%	21	
	No	27%	73%	561	Ns	31%	69%	427	Ns
Image									
Sociability									
Friends round weekly or more	Yes	24%	76%	188		30%	70%	116	
	No	27%	73%	432	Ns	31%	69%	335	Ns
Gender-identity									
In male dominated occupation	Yes	24%	76%	59		32%	68%	373	
	no	27%	73%	563	Ns	26%	74%	77	ns
Religiosity									
Takes part in religious activities	Yes	**41%**	**59%**	**150**		36%	64%	69	
	no	**23%**	**77%**	**474**	**P <.0001**	29%	71%	385	Ns
Has religious belief at 36	yes	29%	71%	420		30%	70%	235	
	no	23%	77%	190	P< 2	30%	70%	208	ns
Background									
Social class non-manual	Yes	**34%**	**66%**	**279**		**40%**	**60%**	**196**	
	No/other	**21%**	**79%**	**343**	**P<.000**	**23%**	**77%**	**253**	**P<.000**

Table 6 7 shows the contemporary measures associated with starting leisure exercise between 36 and 43. These are very similar to the results using measures at age 36.

Table 6-7: Adult measures at 43 and starting leisure exercise between 36 and 43 - unadjusted

		WOMEN				MEN			
		Start	Not start	N		Start	Not start	N	
Education									
Spouse with qualifications	Yes	**36%**	**64%**	**287**		**38%**	**62%**	**207**	
	No	**19%**	**81%**	**311**	**P<.000**	**21%**	**79%**	**237**	**P<.000**
Social circumstances									
Material circumstances									
Owns own home	Yes	**30%**	**70%**	**471**		**33%**	**67%**	**355**	
	No	**16%**	**84%**	**154**	**P<.001**	**21%**	**79%**	**98**	**P<.05**
Income band higher	Yes	**33%**	**67%**	**231**		**37%**	**63%**	**174**	
	No	**24%**	**76%**	**341**	**P<.05**	**26%**	**74%**	**255**	**P<.05**
Adequate income	Yes	28%	72%	508		32%	68%	362	
	No	23%	77%	109	ns	23%	77%	90	P<.1
Go without - lack of money	Yes	26%	74%	94		**18%**	**82%**	**66**	
	No	27%	73%	526	Ns	**32%**	**68%**	**386**	**P<.05**
Social support									
Employed or housewife	Yes	28%	72%	494		**32%**	**68%**	**412**	
	No	23%	77%	132	Ns	**17%**	**83%**	**42**	**P<.05**
Married	Yes	27%	73%	502		32%	68%	365	
	No	25%	75%	124	Ns	25%	75%	89	Ns
Children at home	No	23%	77%	88		26%	74%	90	
	Yes	27%	73%	538	ns	31%	69%	364	ns
Stress									
Depressive symptoms	Yes	27%	63%	107		19%	81%	48	
	No	27%	63%	515	Ns	32%	68%	405	P<.1
Image									
Sociability									
Frequent social contacts	Yes	26%	74%	99		22%	88%	77	
	No	27%	73%	523	Ns	32%	68%	374	P< 1
Gender-Identity									
In male dominated occupation	Yes	27%	63%	84		31%	69%	374	
	No	27%	63%	541	Ns	30%	70%	63	Ns
Religiosity									
Takes part in religious activities	Yes	36%	64%	101		29%	71%	48	
	No	26%	74%	522	P<.1	30%	70%	404	ns
Background									
Social class non-manual	Yes	**35%**	**65%**	**329**		**39%**	**61%**	**214**	
	No	**18%**	**82%**	**297**	**P<.000**	**22%**	**78%**	**240**	**P<.000**

6.8.2 2 Adjusted analysis

A stepwise modelling procedure was used to determine how much influence each of these measures might have on stopping or starting exercise when considered together, as described earlier (§3.6.6). The moderating effect of exercise undertaken as part of daily living: e g. at work, gardening or walking was not taken into account in these models because the outcome is whether people changed, regardless of where they started. Preliminary analysis to check if including exercise undertaken as part of daily living at age 36 made any difference, suggested it did not. Given that the measures of education, social circumstances, image and background behave in a similar way at 36 and 43, the measures at age 36 have been used in preference to the 43 measures, to get a better understanding of what leads to change.

Table 6 8 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with starting leisure exercise between age 36 and 43. In a

multiple regression model for women, they are more education, better social circumstances at 36 and the sociability at 15 and religiosity at 36 aspects of image. Having children at home at age 36 just fails to be significantly associated with women starting leisure exercise. Social class (measured as spouse's social class at either 36 or 43) is not significant and does not significantly affect the other measures, so it is not included or shown. There is an interaction between level of education and sociability. Inspection of the terms suggests it is just due to small numbers in one of the groups, rather than anything meaningful.

For men the measures independently associated with starting leisure exercise are better social circumstances and social class. Education measured by spouse's educational qualifications, comes very close to being significant, but a model containing social class fits the data better (using the Hosmer Lemshow test), and so it is the one shown. However, this is a very fine distinction between education and social class, which requires substantiation.

Table 6-8: Odds ratios and confidence intervals for measures significantly associated with starting leisure exercise between age 36 and 43, allowing for disability

		Women	Men
		Starting Odds ratio	Starting Odds ratio
Education			
Has O levels or more	Yes	2 0* (1 17-3 30)	
	no	1	
Spouse left school at 16, or 16+	Yes	2 2** (1.42-3.50)	
	No	1	
Social Circumstances			
Owns own home at 36	Yes	1 8* (1 07-3.03)	2.3** (1.31-3.95)
	no	1	1
Goes to non-sports clubs at 13	Yes		1 9* (1.19 – 2.94)
	No		1
Image			
Sociability			
Makes friends very easily at 13	Yes	2 1* (1 23-3 89)	
	no	1	
Religiosity			
Takes part in religious activities	Yes	2 1*** (1.33-3 33)	
	No	1	
Background			
Social class non-manual	Yes		1 7* (1 07 – 2 68)
	No		1
N		512	396
Chi-squared		63 3	26 5
DF		5	3
Nagelkerke r square		163	091

* P < .05, ** P < .005, *** P < .0005

Comparing the models for men and women, the main differences are that education, social support, religiosity and sociability feature for women but not for men, while background features for men but not

women. Two of these, education and background, are operating differently as they interact with sex in a combined model. While the others, social support, religiosity and sociability, are significant in a combined model, just fail to be significant when considering the sexes on their own, but do not interact by sex. Given the smaller numbers here the data might be best represented by a model for both sexes (including relevant interactions), which would suggest that education for women, social circumstances (social support and material conditions), religiosity and sociability for both sexes and background for men were associated with starting leisure exercise.

6.8.3 Stopping leisure exercise between 36 and 43

6.8.3.1 Unadjusted relationships

Table 6.9 shows the childhood measures associated with stopping leisure exercise between 1982 and 1989. The picture is very much a mirror image of taking up exercise. For women lack of education, poorer parental circumstances and a less advantageous background are associated with giving up. as is lack of conformity. For men lack of education, poorer parental circumstances, a less advantageous background, and aspects of image - less conformity, less social, less masculine - are associated with giving up leisure exercise.

Table 6.10 shows the adult measures associated with stopping leisure exercise between 1982 and 1989. For men they are lack of education, poorer social circumstances, lack of religiosity and manual background. For women they are lack of education, less advantageous social circumstances and manual background. Table 6.11 shows the contemporaneous measures associated with stopping leisure exercise between 36 and 43. These are very similar to the ones at 36.

Table 6-9: Childhood/Adolescent measures and stopping leisure exercise between 1982 and 1989 - unadjusted

		WOMEN				MEN			
		Stop	Carry on	n		Stop	Carry on	n	
Education									
Cognitive potential above av.	Yes	**42%**	**58%**	**504**		**34%**	**66%**	**550**	
	no	**49%**	**51%**	**279**	**P<.001**	**45%**	**55%**	**362**	**P<.001**
Left school at 16, or 16+	No	**51%**	**49%**	**397**		**48%**	**52%**	**472**	
	yes	**37%**	**63%**	**443**	**P<.0001**	**31%**	**69%**	**521**	**P<.00001**
Parents interested in primary school	No	**50%**	**50%**	**306**		**44%**	**56%**	**428**	
	yes	**41%**	**59%**	**441**	**P<.05**	**35%**	**65%**	**463**	**P<.01**
Social Circumstances									
Material circumstances									
Parents own home @ 4	Yes	39%	61%	254		**33%**	**67%**	**267**	
	no	46%	56%	572	P < .1	**42%**	**58%**	**702**	**P<.05**
Parents own home @ 15	Yes	**40%**	**60%**	**344**		**34%**	**66%**	**381**	
	no	**49%**	**51%**	**411**	**P <.05**	**44%**	**56%**	**517**	**P<.01**
Social Support									
Parental divorce	Yes	45%	55%	65		40%	60%	82	
	No	43%	57%	808	Ns	39%	61%	946	Ns
Parents alive and well	No	47%	53%	110		45%	55%	132	
	Yes	44%	56%	644	Ns	39%	61%	765	P< 2
Interests with parents	Yes	44%	56%	619		38%	62%	644	
	No	48%	52%	130	Ns	43%	57%	265	P<.2
Interests with peers	Yes	44%	56%	650		39%	61%	807	
	No	51%	49%	99	P<.2	43%	57%	101	Ns
Goes to non-sports clubs at 13	Yes	42%	58%	317		36%	64%	358	
	No	46%	54%	432	ns	42%	58%	551	P<.1
Goes to non-sports clubs at 15	Yes	45%	55%	412		38%	62%	421	
	No	45%	55%	315	Ns	39%	61%	467	ns
Stress									
Childhood anxiety depression	Yes	51%	49%	37		48%	52%	42	
	No	45%	55%	544	Ns	38%	62%	723	Ns
Image									
Conformity									
Conforms at 13	Yes	45%	55%	609		38%	62%	662	
	No	43%	57%	129	ns	44%	56%	233	P < .1
Conforms at 15	Yes	45%	55%	574		38%	62%	659	
	No	45%	55%	157	Ns	42%	58%	225	Ns
Works badly at school at 13	No	45%	55%	697		**38%**	**62%**	**810**	
	yes	43%	57%	47	Ns	**49%**	**51%**	**90**	**P<.05**
Works badly at school at 15	No	44%	56%	692		**37%**	**63%**	**799**	
	yes	57%	43%	42	P<.2	**54%**	**46%**	**90**	**P<.01**
Sociability									
Very popular at 13	Yes	43%	57%	101		**29%**	**71%**	**152**	
	no	45%	55%	650	Ns	**41%**	**59%**	**754**	**P < .01**
Makes friends very easily at 13	Yes	45%	65%	127		38%	62%	170	
	no	44%	66%	620	Ns	40%	60%	728	Ns
Makes friends very easily at 15	Yes	47%	63%	139		38%	62%	152	
	no	45%	65%	587	Ns	39%	61%	733	Ns
Gender-identity									
Exhibits feminine behaviour at 13	Yes	44%	56%	208		**48%**	**52%**	**197**	
	no	45%	55%	505	Ns	**36%**	**64%**	**688**	**P<.005**
Exhibits feminine behaviour at 15	Yes	47%	53%	215		**45%**	**55%**	**220**	
	no	45%	55%	490	Ns	**37%**	**63%**	**652**	**P <.05**
Religiosity									
Religious upbringing	yes	43%	57%	725		38%	62%	792	
	no	47%	53%	148	Ns	42%	58%	235	Ns
Goes to Sunday school at 11	Yes	43%	57%	654		38%	62%	733	
	No	51%	49%	110	P< 2	42%	58%	186	Ns
Background									
Father non-manual at 4	Yes	**38%**	**62%**	**395**		**30%**	**70%**	**417**	
	no	**51%**	**49%**	**410**	**P < .001**	**46%**	**54%**	**535**	**P < .0001**
Father non-manual at 15	Yes	**40%**	**60%**	**343**		**30%**	**70%**	**409**	
	no	**51%**	**49%**	**362**	**P < .01**	**47%**	**53%**	**417**	**P < .0001**
Mother went to secondary school	yes	**36%**	**64%**	**328**		**32%**	**68%**	**387**	
	no	**50%**	**50%**	**448**	**P < .0001**	**44%**	**56%**	**534**	**P < .001**
Father went to secondary school	yes	**39%**	**61%**	**382**		**32%**	**68%**	**441**	
	no	**50%**	**50%**	**392**	**P < .01**	**46%**	**54%**	**471**	**P < .0001**

Table 6-10: Adult measures at 36 and stopping leisure exercise between ages 36 and 43 - unadjusted

		WOMEN				MEN			
		Stop	Carry on	n		Stop	Carry on		
Education									
Has O levels or more	No	**49%**	**51%**	**540**		**44%**	**56%**	**530**	
	yes	**32%**	**68%**	**294**	**P<.00001**	**32%**	**68%**	**451**	**P<.00001**
Spouse with qualifications	Yes	41%	59%	471		**32%**	**58%**	**434**	
	No	48%	52%	348	P< 1	**44%**	**56%**	**565**	**P<.000**
Spouse left school at 16, or 16+	Yes	**36%**	**64%**	**421**		**31%**	**69%**	**551**	
	No	**51%**	**49%**	**436**	**P<.000**	**47%**	**53%**	**463**	**P<.000**
Social circumstances									
Material circumstances									
Owns own home	Yes	**41%**	**59%**	**725**		**35%**	**65%**	**804**	
	No	**57%**	**43%**	**148**	**P < .001**	**53%**	**47%**	**223**	**P < .00001**
Low income or none (own)	Yes	43%	57%	596		**49%**	**51%**	**490**	
	No	45%	55%	277	Ns	**30%**	**70%**	**538**	**P<.00001**
Adequate Income	Yes	43%	57%	728		**37%**	**63%**	**834**	
	No	48%	52%	129	Ns	**46%**	**54%**	**187**	**P<.05**
Go without - lack of money	Yes	51%	49%	113		**49%**	**51%**	**136**	
	No	42%	58%	748	P<.1	**37%**	**63%**	**883**	**P<.05**
Social support									
Married	Yes	44%	56%	749		**37%**	**63%**	**864**	
	No	43%	57%	124	Ns	**49%**	**51%**	**164**	**P < .01**
Children at home	No	42%	58%	119		**44%**	**56%**	**273**	
	Yes	44%	56%	754	ns	**37%**	**62%**	**755**	**P<.05**
Member of clubs, etc	Yes	**37%**	**63%**	**496**		**35%**	**65%**	**704**	
	No	**52%**	**48%**	**376**	**P<.000**	**47%**	**53%**	**332**	**P<.000**
Employed or housewife	Yes	44%	56%	790		**38%**	**62%**	**973**	
	No	37%	63%	71	Ns	**62%**	**58%**	**37**	**P < .01**
Stress									
Depressive symptoms	Yes	47%	53%	64		52%	48%	33	
	No	43%	57%	803	Ns	38%	62%	991	P<.2
Image									
Sociability									
Friends round weekly or more	Yes	41%	59%	339		38%	62%	309	
	No	45%	55%	528	P<.2	39%	61%	712	Ns
Gender-identity									
In male dominated occupation	Yes	41%	59%	96		39%	61%	871	
	no	44%	56%	775	Ns	41%	59%	153	Ns
Religiosity									
Takes part in religious activities	Yes	40%	60%	315		31%	69%	203	
	no	46%	54%	553	P <.2	41%	59%	824	P <.01
Has religious belief at 36	yes	43%	57%	625		39%	61%	565	
	no	43%	57%	227	Ns	39%	61%	442	Ns
Background									
Social class non-manual	Yes	**39%**	**61%**	**507**		**31%**	**69%**	**621**	
	No/other	**49%**	**51%**	**362**	**P<.01**	**50%**	**50%**	**395**	**P<.0001**

Table 6-11: Adult measures at 43 and stopping leisure exercise between ages 36 and 43 - unadjusted

		WOMEN				MEN			
		Stop	Continue	N		Stop	Carry on	N	
Education									
Spouse with qualifications	Yes	**39%**	**61%**	**517**		**33%**	**67%**	**591**	
	No	**50%**	**50%**	**323**	**P<.005**	**47%**	**53%**	**407**	**P<.000**
Social circumstances at 43									
Material Circumstances									
Owns own home	Yes	**42%**	**58%**	**781**		**36%**	**64%**	**873**	
	No	**57%**	**43%**	**92**	**P<.01**	**55%**	**45%**	**152**	**P<.000**
Income band higher	yes	**39%**	**61%**	**447**		**32%**	**68%**	**568**	
	No	**49%**	**51%**	**385**	**P<.005**	**48%**	**52%**	**433**	**P<.000**
Adequate Income	Yes	43%	57%	755		**38%**	**62%**	**905**	
	No	48%	52%	111	Ns	**49%**	**51%**	**113**	**P<.05**
Go without - lack of money	Yes	47%	53%	81		**49%**	**51%**	**86**	
	No	43%	57%	789	Ns	**38%**	**62%**	**938**	**P<.05**
Social support									
Employed or housewife	Yes	44%	56%	732		**38%**	**62%**	**990**	
	No	39%	61%	141	ns	**40%**	**60%**	**38**	**P<.01**
Married	Yes	45%	55%	706		**37%**	**63%**	**843**	
	No	38%	62%	167	P<.2	**46%**	**54%**	**185**	**P<.01**
Children at home	No	40%	60%	102		44%	56%	183	
	Yes	44%	56%	771	ns	38%	62%	844	P<.2
Stress									
Depressive symptoms	No	43%	57%	745		38%	62%	942	
	Yes	45%	55%	125	Ns	49%	51%	84	Ns
Image at 43									
Sociability									
Frequent social contacts	Yes	41%	59%	141		39%	61%	163	
	No	44%	56%	728	ns	39%	61%	862	ns
Gender-identity									
In male dominated occupation	Yes	45%	55%	136		39%	61%	857	
	No	43%	57%	735	Ns	36%	65%	141	ns
Religiosity									
Takes part in religious activities	Yes	38%	62%	196		32%	68%	148	
	No	45%	55%	675	P< .2	40%	60%	877	P<.1
Background									
Social class non-manual	Yes	**38%**	**62%**	**610**		**32%**	**68%**	**665**	
	No / n/a	**56%**	**44%**	**263**	**P<.000**	**52%**	**48%**	**355**	**P<.000**

6.8.3.2 Adjusted analysis

A stepwise modelling procedure was used to determine how much influence each of these measures might have on stopping exercise when considered together. The moderating effect of exercise undertaken as part of daily living - e.g. at work, gardening, walking - was not taken into in these models because the outcome of interest is whether people changed, regardless of where they started. In most cases, it made little difference to the results. Given that the measures of education, social circumstances, image and background behave in a similar way at 36 and 43, the measures at 36 have been used in preference to the 43 measures, to get a better understanding of what leads to change

Table 6.12 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with carrying on (or not stopping) leisure exercise between age 36 and 43. For women these were more education, better social circumstances - i e with social support and home ownership - and being non-manual

Table 6-12: Odds ratios and confidence intervals for measures significantly associated with stopping leisure exercise between age 36 and 43, allowing for disability

		Women		Men	
		Carry on		Carry on	
Education					
Has O levels or more	Yes	1.6**	1.16-2.19		
	no	1			
Social Circumstances					
Owns own home at 36	yes	1.7*	1.14-2.48		
	no	1			
Owns own home at 43	Yes			1.7*	1.09 - 2.75
	no			1	
Low income or none (own) at 36	No			1.6*	1.11 – 2.19
	yes			1	
Member of clubs, etc at 36	Yes	1.7***	1.27-2.26	1.5*	1.09 – 2.10
	No	1		1	
Married at 36	Yes			1.7*	1.07 – 2.65
	No			1	
Image					
Sociability					
Very popular at 13	Yes			1.6*	1.04-2.12
	No			1	
Background					
Father went to secondary school	Yes			1.7*	1.14 – 2.40
and non-manual	no			1	
Social class non-manual at 36	Yes			1.5*	1.04 – 2.12
	No			1	
Social class non-manual at 43	Yes	1.5*	1.10 – 2.13		
	No	1			
N		828		757	
Chi-squared		50.8		77.9	
DF		4		7	
Nagelkerke r square		.079		.136	

P < .05, ** P < .005, *** P < .0005

For men carrying on leisure exercise is associated with better social circumstances, an aspect of image and background Income, home ownership, social support and marriage and sociability are all protective against giving up leisure exercise, as are both current social class and parental social class and education. There is an interaction between the social support measures. Inspection of the interaction showed that, either being married or belonging to clubs is sufficient to protect against giving up leisure exercise, re-assuringly suggesting these are measuring the same concept.

Comparing men and women, the differences are that education features for women but not men, while social circumstances, sociability and background feature more strongly for men Education and marriage and income are operating differently as they interact with sex in a combined model, while parental social class and education are significant in a combined model.

6.8.4 Change between age 36 and age 43

For men the measures associated with starting leisure exercise are very similar to those for carrying on, i.e. social circumstances and background Education just fails to feature. Image features as sociability

associated with starting exercise and carrying on For women education and social circumstances are associated with both starting and carrying on, while background and social support are associated with carrying on and religiosity and sociability are associated with starting. For women it looks like the effect of the cost of leisure exercise, the long-standing association between education and women's physical activity, and education are promoting change. Religiosity is also promoting change. Finally, as for men there appears to be the effects of long-standing historic trends, which make leisure exercise more the socially acceptable norm for non-manual women

As a final check that this is a correct interpretation of the data, a final model was constructed of leisure exercise at 43 allowing for disability and leisure exercise at 36. The starting point for this model was all the measures previously found to be significant or almost so in adjusted models of participation at 36, starting between 36 and 43, or stopping between 36 and 43, plus any measures that might have failed to show significance because of lack of power.

Table 6.13 shows the odds ratio, confidence interval and its associated level of significance for each measure that was significantly associated with taking leisure exercise at 43 allowing for leisure exercise at 36 and disability at 43; i.e. the measures associated with healthy change. For women these are education, social circumstances and background, i.e. more education, more social support, home ownership and non-manual social class are all associated with change. Religiosity at 36 just fails to be significant. There are no interactions.

For men the measures independently associated with conditional change are prior measures of education, social circumstances, some aspects of image and background. The model is very similar for whichever measure of background before age 43 is used, i.e. parental social class, parental education or social class at age 36, but only one measure is significant in the model. Social class does interact with spouse's educational level, and it is neither having an educated spouse nor being non-manual which is associated with not changing, suggesting there is not a very clear distinction between social class and education for men. This model is consistent with the models for changing to start or stop leisure exercise, as education was almost significant when considering men starting leisure exercise.

Comparing men and women, the main differences (apart from the same concept is represented by slightly different measures) are that own level of education features for women, higher income features for men and sociability features for men. Checking whether these interact with sex in a combined model confirms that level of education and income are operating differently for men and women, but that sociability is not. Sociability is significant in a combined model as is religiosity.

Table 6-13: Odds ratios and confidence intervals for measures significantly associated with taking leisure exercise at 43 in 1989, allowing for leisure exercise at age 36 in 1982 and disability.

		Women		Men	
Education					
Has O levels or more	Yes	1.6**	1.24-2.15		
	no	1			
Spouse left school at 16 or 16+	Yes	1.4*			
	no	1			
Spouse with qualifications	Yes			1.3*	1.03 – 1.74
	No			1	
Social Circumstances					
Low income or none (own) at 36	Yes			1.6**	1.19 – 2.07
	No			1	
Owns own home at 36	Yes	1.7**	1.23 – 2.23	1.7**	1.22 – 2.31
	No	1		1	
Goes to non-sports clubs at 13	Yes			1.4*	1.10 – 1.84
	No			1	
Member of clubs, etc at 36	Yes	1.6***	1.27-2.03		
	no	1			
Image					
Sociability					
Very popular at 13	Yes			1.5*	1.05 – 2.16
	no			1	
Background					
Social class non-manual at 36	Yes			1.4*	1.03 – 1.81
	No			1	
Social class non-manual at 43	Yes	1.4*	1.08 – 1.84		
	No	1			
N		1412		1189	
chi squared		98 6		84.3	
Df		5		6	
Nagelkerke r square		.082		.083	

* P < .05, ** P < .005, *** P < .0005

6.9 Discussion

These results show that participation in leisure exercise at the start of a period of health promotion was independently associated with education, social circumstances, some aspects of image and for women, background. Change to healthier behaviour is associated with education, social circumstances, some

aspects of image and background. Generally, these are all acting independently In addition, both participation and change are often related to prior observations of the measures, which suggest they might be predictive. As such it shows all the categories in the hypothesis are relevant both to healthier behaviour at the outset, and healthy change. This discussion largely concerns adjusted relationships, i.e. the relationship found when allowing for measures in the other three categories Before discussing these results in detail, there are some caveats, concerning power and measurement error.

As pointed out in the results there are a few cases where an effect may not be observed because of insufficient power rather than because it does not exist. This is most likely to happen if the event is quite rare in this sample. A stronger relationship is needed to detect an effect for a relatively rare event. In the multiple regression analysis of leisure exercise at 36, the samples are about 1200, so there is sufficient power to detect smallish effects (odds ratios of about 1.6) as long as the event occurs for more than about 15% of the sample. For men and women the measures which are significant in unadjusted analysis are, with the exception of childhood anxiety depression and for men unemployment or depression in adulthood, common enough not to suffer from insufficient power. In the analysis of conditional change the measures which might have suffered from lack of power for men are parental health, childhood anxiety depression, sociability, unemployment and religiosity, for women they are childhood anxiety depression, sociability and being short of money. So, overall this analysis may have downplayed the role of depression, unemployment and some aspects of image As mentioned in previous chapters Sunday school is not a very good measure of childhood religiosity so measurement error may also have contributed to downplaying the role of religiosity.

Change in physical activity levels in relation to education, social circumstances, image and background has not often been examined. One previous study in Finland, using a follow-up study did find different rates of change in physical activity by social class, but did not look at the complete spectrum of possible reasons for change (Aro et al, 1986). Two other studies in Denmark and Australia, comparing cross-sectional data over time, found no difference in rates of change in physical activity by educational level (Bennett, 1995), (Osler et al, 2000). Looking at cross-sectional data over time may make it more difficult to detect differences, particularly as educational levels are also changing over time.

6.9.1 Education

Education is associated with leisure exercise, and particularly for women with changing to leisure exercise. This association is independent of other measures of SES and social support. This could be education promoting change along the lines suggested by the health psychologists. It is puzzling that education is playing less of a role for men. Maybe it is more emancipated women copying men's physical activity patterns, much as happened for smoking.

6.9.2 Social Circumstances

Better social circumstances both material and social support are consistently associated for both sexes with leisure exercise and healthy change. That material circumstances are associated with physical activity is consistent with the literature reviewed, and it is eminently plausible that cost should be a barrier. Why this association should be more pronounced for men it not quite clear. It could be that men prefer more

expensive sports such as golf or are more sensitive to financial considerations. It could be that women are more affected by being short of money rather than having lower income, however that might not have shown because of lack of power. Anyway, regardless of exactly how it works it does seem that men and women are not sensitive to exactly the same financial constraints.

The role of social support in participation is consistent with other studies, but this study has the advantage of showing that social support has an effect independent of SES. As such, it possibly re-enforces the importance of considering leisure exercise as a group activity. The role of social support in change is not often shown in epidemiological studies, and it is possible that it is overstated here, because some of the measures used could be markers for sport participation as well as social support. There are also indications that the construction of social life makes it easier for men to participate, i e. marriage seems to promote physical activity for men, but not for women. This is consistent with other studies and with married women; especially working married women, having less free time at this stage in life.

Stress (measured by depression) did not appear to be independently related to physical activity or change in physical activity. This could either be that depression is not a good proxy for stress, or that depression is a product of some of the other factors considered, or simply that depression does not occur often enough in the NSHD for this type of analysis to be effective. In unadjusted analysis, childhood anxiety depression is associated with not taking exercise at 36, and women not starting exercise, while adult depression is associated with men not taking exercise at 36. So, it may simply be that there is not much relationship between taking exercise and depression.

6.9.3 Image

Some aspects of image were associated with initial participation and healthy change. For men sociability, masculinity and religiosity in adolescence were all associated with being more likely to participate at age 36. For women sociability in adolescence was associated with participation at 36. For both men and women sociability and religiosity were associated with healthy change, even though it is possible that their role was underplayed. These findings are consistent with the few studies, which have looked at these factors in relation to participation or change. They throw new light on why people choose to participate in physical activity, and why people change. These findings indicate that the public image of an activity does influence who does what and who changes, and it is nice to speculate that muscular Christianity was still having an influence for men in this generation. Image generally operates in the same way for men and women.

6.9.4 Background

Background was associated with initial participation for women, and change for both men and women, independent of other measures of SES status. This suggests that social acceptability is playing a role, possibly more so for women than men That would not be at all surprising if one were to consider the social construction of leisure time for women, particularly for working class women. Do women have leisure time that it is acceptable to spend on themselves, or is it part of their role to spend their time looking after others? Middle class women have a longer tradition of looking after themselves and spending time on themselves, but if social change follows a 'trickle down model' then one would expect physical

activity to become more prevalent in the manual groups, notwithstanding all other constraints on the choices they can make.

Overall this suggests that because of the public role of leisure exercise and historic trends, there are both different participation rates and differential rates of change that will cause widening differences between the more and less advantaged as time goes on, and this could be checked using the data at age 53 from the NSHD. However it should not be concluded that this is because some groups have less interest in their health than others, it is more the constraints imposed by the material and social world.

7 DIET

7.1 Introduction

Diet is a factor in mortality and illness. Currently too much fat and low consumption of fruit and vegetables are seen as risk factors for heart disease and cancer (McGinnis, Foege, 1993), (DHSS, 1984) During the lifetime of the NSHD members', there have been changes in attitudes to diet and in the foods eaten. For example, full fat milk was an obligatory part of their childhood diet, whereas now it is to be avoided The NSHD barely ate pasta in childhood (Prynne et al, 1999), whereas now it is very common. These changes have happened for many reasons, such as changes in supply, regulation or taste (Flynn et al, 1998), (Fine et al, 1998), (Wrigley, 1998). They cannot be explained purely based on people listening to the public health message and taking appropriate action, as there is little evidence of British people making sustained dietary changes in the 1980s (MAFF, 1991). This may be because the advice is perceived as inconsistent with previous advice and inconsistent with lay observations, and in need of being considered in a more holistic fashion (Backett, 1990), (Frankel et al, 1991), (Davison et al, 1991).

7.2 Hypothesis

The hypothesis is described in chapter 3.6.1 and Figure 3.1

7.3 Health education message

Early in the 20th century, the emphasis was on eating enough of the right things, though what that was, how it was to be achieved and whether it was possible were all a matter of controversy (Smith, 1997). During WW2, rationing was intended to ensure all had sufficient nutrients. In the early post-war period the government took an active part in ensuring nutrients were available, particularly for children, through welfare clinics, school milk and school meals School milk was provided up until 1968, when it was withdrawn first for secondary children, then for those over 7 in 1971, as there was no longer thought to be any health need (Burnett, 1994). Education authorities were obliged to provide a school lunch suitable as the main meal of the day until 1980 (Burnett, 1994).

In the 1970s, the emphasis changed to eating less of the 'wrong' things (DHSS, 1978). There were key reports (NACNE, 1983) and (DHSS, 1984) on healthy eating in the early 1980s, advocating restraint. These reports received substantial publicity because of the opposition of the food industry, the lack of enthusiasm in the government and the vociferousness of outraged campaigning groups (Smith, 1997).

These reports focused primarily on nutrients (i.e. composition of the diet) not specific food choices. The National Advisory Committee on Nutrition Education report (NACNE) by the Health Education Council recommended decreasing fat, salt and sugar intake whilst increasing fibre (NACNE, 1983). The changes NACNE thought achievable in the 1980s were

- reduce total fat intake by 10% from 38% of total energy to 34%
- reduce saturated fatty acids (SFAs) by 15%
- increase polyunsaturated fatty acids (PUFA) by 25%

- reduce sugar by 10% to 34kg per year
- increase dietary fibre by 25% to 25g/day
- reduce salt by 10% to 11g a day
- NACNE provided some advice on how to change food consumption
- 'reductions from dairy fats, for example of about 5g; from meats about 3g, and 1g from biscuits and cakes'
- 'intake between meals from confectionery and soft drinks in particular should be reduced'
- 'increasing bread, potato, and fruit and vegetable consumption, each of them, by 25%-30%'
- 'reduction of salt by 10%,.., mainly by adding less in cooking, and at table'

The Committee on Medical Aspects of Food Policy report (COMA) from the DHSS gave the government view and focused more on fat and fibre, with less emphasis on sugar and salt (DHSS, 1984). The specific recommendations on nutrients from COMA were

- '15% of food energy for SFAs and 35% of food energy for total fat'
- 'intake of simple sugars should not be increased further'
- 'intake of common salt should not be increased further'
- 'The panel sees advantages in compensating for a reduced fat intake with increased fibre rich carbohydrates...provided this can be achieved without increasing total intake of common salt or simple sugars'

The message was received in the health education community and at large as a focus on fat, for example the editorial 'A potentially profitable report' in the Health Education Journal after COMA came out. Campaigns reported in the Health Education Journal often had an emphasis on fat, (Wise et al, 1986), (Tate, Cade, 1990), (Abbott, Berry, 1989). Even today, recipes in a popular magazine such as Woman give fat content along with cost and preparation time, but not fibre, salt or sugar content.

The message was interpreted within health education (e. g. (Richardson, Grigg, 1987)) as about changing the composition of the diet. To achieve results requires translating food intake into nutrients, adjusting the level of nutrients, translating that back into acceptable meals, and then eating them. All this without any obvious feedback, apart from the observation that eating along the lines of the 'recommended' healthy diet was not particularly enjoyable (Holm, 1993), (Cole-Hamilton et al, 1986) This makes it a very hard message to follow as noted at the time (Gibney, Lee, 1991). Several contemporary studies found very few people meeting the short-term NACNE recommendations (Cade, Booth, 1990) (Nelson, 1985), even amongst dieticians (Black et al, 1984).

The health message was also difficult to follow because it was a relative message from an undefined baseline, so who was to know how much they should change? In the 1980s, the ability to make the recommended changes required an awareness of the composition of foods and one's own intake. In 1984/5 less than 30% of the participants in the health and lifestyle survey gave correct answers to whether eight common foods contained fibre (Whichelow, 1988). Later on, consumers were also vague about the fat

content of food (Mela, 1993). Knowledge is not a sufficient condition for dietary change (Shepherd, Tower, 1992), but it is hard to achieve change in nutrient intakes without it.

7.4 Previous research

In the 1980s, there was no consistent, well-validated operationalisation of a healthy diet, used to quantify who was eating it and what were their characteristics. Accurate diet data is expensive, difficult and time-consuming to collect. Collecting information on 'marker' foods, such as use of low-fat spreads, was used as an alternative. However, the reported use of 'marker' foods requires validation against what is consumed and the overall composition of the diet. This is not usually available. The selection of marker foods also needs to avoid reflecting prejudices about 'poor' dietary habits, such as eating chips, unless these have been shown to be related to an unhealthy nutrient intake overall. The selection also needs to avoid items that are 'fashionable'; tracking those will elucidate how fashion trends operate but not necessarily, who has followed the message on nutrient intakes.

Ideas about a healthy diet can be mixed up with value judgements. Explaining NACNE in plain language included eating 'better quality loaves' or more 'good quality bread and potatoes, vegetables and fruit' (Walker, Cannon, 1984). An evaluation of nutritional knowledge of school children, remarks 'these snacks were poor quality foods' and later talks of 'poor quality of the meals, which lacked fruit and vegetables and contained little protein' (McGuffin, 1986). Another discussion of patients' perception of diet, discusses junk food and eating between meals, as measures of unhealthy diets (Wallace et al, 1988).

Different studies used different measures for categorising healthy eaters. It could be, eating brown bread, not adding sugar to tea or coffee and eating the right number of meals a day (Sweeting et al, 1994). It could be; eating predominately brown or wholemeal bread, eating low fat or polyunsaturated spreads, eating fresh fruit at least once a day, eating salads or raw vegetables at least once a week in winter, eating chips not more than twice a week, eating fried food not more than twice a week, and not eating sweets/biscuits every day (Blaxter, 1989) It is not obvious why NACNE with its advice on more bread and potatoes and COMA with its emphasis on lowering fat translate into these particular eating habits, rather than say semi-skimmed milk, eating brown rice and lentils, or even eating more bread and potatoes. It can look like identifying what are seen as working class food habits and denigrating them a priori.

This discussion considers research on food or nutrient intakes. Findings concerning the indirect effect of nutrient intakes, such as body mass index (BMI) or cholesterol levels, are not considered as they are not the direct outcome of food behaviour and may be mediated in other ways, such as stress, birth weight, physical activity, or smoking. There are two issues to be considered, the characteristics of those who are healthy eaters and those who change to healthy eating. There may be people who are forced by medical conditions to eat 'special' diets, or to make changes; these people are not typical of the population who are expected to change their diet on their own, so research on why and how people make changes in response to medical conditions has not been considered in this discussion.

7.4.1 Education

Many studies have found that those with more education have healthier eating habits, such as eating fruit and vegetables (Sorensen et al, 1998), (Roos et al, 1998), (Uitenbroek et al, 1996), not adding salt or not eating the visible fat on meat (Bennett, 1995) or not eating high milk fat products (Karvonen, Rimpela, 1996). However, when nutrient intakes are looked at the differences between educational levels are smaller (Roos et al, 1996). For diet, the evidence is that all educational groups are changing with little difference between them (Bennett, 1995), (Osler et al, 2000).

7.4.2 Social Circumstances

7.4.2.1 Material

Several studies have shown that eating the diet recommended by NACNE is more expensive (Mooney, 1990), (Cade, Booth, 1990). However, those likely to be in economic difficulties (unemployed, living in houses in multiple occupation, on benefits) report eating less (Cade, 1992), (Gregory et al, 1990). This can be construed as a healthy fat intake and an unhealthy fibre intake. There is little direct evidence of cost being a barrier to change, but it may be so.

7.4.2.2 Social Support

As regards wider social support and diet, living in some neighbourhoods is more stressful than others (Allison et al, 1999). This could have an indirect effect on diet through stress. Those living in deprived areas in Britain have less access to shops selling a healthy diet and pay higher prices (Mooney, 1990). There are also regional differences in food intakes (Fehily et al, 1990), (Braddon et al, 1988). These have not been much explored, nor their relation to dietary change. Nevertheless some people may find it harder to change either because of the micro effect of their neighbourhood or because of their traditional diet.

There is mixed and sparse evidence for social support promoting a healthy diet. As regards the workplace, one study found that those who have the support of their co-workers are more likely to contemplate changes (Sorensen et al, 1998). At a family level one study found married men and women eating healthier foods (Roos et al, 1998), and women (but not men) with children eating healthier foods (Roos et al, 1998). On the other hand, at a more qualitative level men and children are thought to have a strong and not necessarily positive influence on family diets, (Pill, Parry, 1989), (Sorensen et al, 1998)

7.4.2.3 Stress

There are conflicting lay perceptions about stress and eating. There is the idea that people might comfort eat, or might be too 'keyed up' to eat. There is some evidence for both these perceptions One study looking at the relationship between stressful events on a daily basis and reported food intake found most people reported eating less in response to stress but some reported eating more (Stone, Brownell, 1994), with those under severe stress more likely to eat less and some of those under more moderate stress eating more. Other studies have found some people eating more fat and sugar in response to work stress (Steptoe et al, 1998) or job-strain in men (Hellerstedt, Jeffery, 1997). Stress might lead some people to eat less

healthily, and make change for them more difficult. It needs more clarification. For consistency with the rest of this thesis stress, measured by depression is expected to be associated with unhealthy behaviour

7.4.3 Image

Sociologists have pointed out that food is used for far more than satisfying hunger – displaying status and distinction from other groups (Veblen, 1994 [1899]), (Bourdieu, 1984), tacit communication (Douglas, Nicod, 1974). This is useful in understanding the structure of meals and cuisines, some of the associations with certain foods and appreciating the importance of tradition. For example, Mintz provides a description of the significance of Coco-cola to American soldiers (Mintz, 1997). On the other hand, to take a British example lentils and brown rice conjure up a different image of the eater from caviar and champagne. Even though eating may be largely a private and family affair, foods have a public image, whether the same is true of nutrients is debatable. However, the public health message in the 1982 was about nutrients, so the question is, what was the public image of eating a healthy diet in the 1980s? The next section considers the aspects of image previously defined (§3.4.3.1.1) and their relationship to nutrients

7.4.3.1 Conformity

Some aspects of health behaviour, such as smoking, have been investigated as related to rebelliousness (as discussed in other results chapters). Neither diet nor nutrient intakes are usually considered in this way. Paying attention to diet in 1980s was sometimes denigrated 'food faddism'. For example headlines along the lines of 'middle class food fads harm children' (Cannon, 1987). So, there could be a perception of healthy diets, as cranky and a bit odd. On the other hand carrying out health education directives is conforming to authority. However, in the 1980s there was less than whole-hearted government support for the healthy eating message, shown by it abolishing the independent Health Education Council responsible for NACNE (Smith, 1997). Hence following a health diet in the 1980s may not have been seen as conforming, and public opinion was not all for it (Anderson, 1985).

7.4.3.2 Sociability

Food is a way of cementing relationships, marking group membership and special occasions throughout life, from christening parties to wakes (Mennell et al, 1992). Sociability is a valued aspect of meals (Lupton, 2000). Whether this relates to the nutrients actually consumed (as long as they are palatable) has not been investigated. The connection between nutrients and sociability is arguable both ways. It could be that those concentrating on the social occasion eat less, or forget what they are doing and eat more, or there could be no relationship at all, or it could depend on the other group members. It is not obvious how sociability might be associated with diet or dietary change. It is considered for consistency with the other chapters.

7.4.3.3 Gender-identity

There are strong gender associations with body shape. Popularly, slimness is desirable for women. Concepts of what are fattening foods are very important (at least for women). In 1969, a survey found that bread, cakes and biscuits, potatoes, sugar and sweets and chocolates were seen as fattening foods (UK Margarine & Shortening Manufacturers' Association, 1969). 'Vogue' was blaming starchy foods for

fatness in 1957 (Lytton Toye, 1957) Negative perceptions of starchy foods remain (Stubenitsky, Mela, 2000). In this context, NACNE is recommending what might be seen as a fattening diet.

Historically and culturally there are clear perceptions of what is suitable for men and women. The consensus is that in the 19th century and the early 20th century in lower income families 'men ate far more meat, milk and potatoes than women who in turn ate more sugars and fats than men. In effect the men were eating cooked meals of meat and potatoes.. while the women... largely confined themselves to eating bread with jam or treacle and drinking tea' (Thompson, 1990). In the rationing of World War II, men were far more likely than women to complain of insufficient meat, particularly men in heavy industry (Wartime Social Survey, 1942). Women complained about fruit, fats and sugar. There is some evidence (Nelson, 1986) that this pattern of food distribution continued into the later 20th century. Detailed surveys of food intakes show clear differences between men and women (Hulshof et al, 1991), (Braddon et al, 1988). Popularly meat has strong associations with masculinity (Fiddes, 1991), as satirised in 'Real Men Don't Eat Quiche' (Fernstein, 1982).

The public image of paying attention to diet, and eating a healthy diet is as a more feminine thing to do Older publications on diet tend to be addressed to women (DHSS, 1976). There is evidence from one small US study that college women identifying with feminist values had less disturbed eating (Synder, Hasbrouck, 1996). However, apart from differences in the eating habits of men and women, there is nothing on how gender-identity affects eating habits, or changes in eating habits. However one would expect that men would be less willing to change than women, and that those who saw themselves as more masculine would be less likely to have healthy diets and would be less willing to change.

7.4.3.4 Religiosity

Restraint, self-control and not enjoying pleasures of the body are part of the teaching of Christian religions (Turner, 1982). Gluttony is one of the seven deadly sins. Religiosity should be associated with lower consumption, and eating less palatable foods, such as fibre rich brown rice, brown bread, and the like.

There is little investigation or evidence. One small study of Welsh working class women (RG IV and V) found that those who recognised the importance of lifestyle choices, amongst other factors related to health, more often demonstrated religious commitment and displayed healthier eating patterns (Pill, Stott, 1985). Pill and Stott's suggestion about paying more attention to religiosity in health behaviour has not been followed up.

7.4.4 Background - Social trends

Historically the diet eaten by the poor was grains, legumes and vegetables, flavoured with the odd bit of something interesting, for example the diet of bread, potatoes and jam being consumed by the poor in Britain in the early 20th century (Boyd-Orr, 1937) There is also a continuing trend for the better off to eat a more varied diet, with more fat and more fruit, as in the general trends summarised from the National Food Survey (Carr-Saunders et al, 1958), (Nelson, 1993), or one-off surveys (Bransby, Osborne, 1953), (Black et al, 1976), (Cook et al, 1973). This trend continued into the 1980s (Morgan et al, 1989), (Bolton-Smith et al, 1991).

This century, rationing from 1939 to 1956 had a dramatic effect on diet, bringing everybody's diet much closer together (Nelson, 1993). Since the end of rationing overall trends in nutrient intakes are :

- less total intake
- less sugar
- less carbohydrate
- more alcohol
- relatively more protein
- little change in the proportion of fat in the diet (Nelson, 1993), (MAFF, 1991)

In terms of foods this looks like less bread, potatoes and jam, and more meat and dairy products. In terms of values it looks like less 'poverty' foods and more 'luxury' foods. This can be seen in comparisons of food intakes across the years, comparing women in South Wales in 1966 and 1983 (Elwood et al, 1990), or pregnant women in Aberdeen in 1950/1 and 1984/5 (Thompson et al, 1989).

Contemporary attitudes and aspirations bear out the same trend. Surveys during WW2 found complaints of insufficient meat, fruit, fats and sugar. Very few wanted more vegetables; no one wanted more bread and potatoes (Wartime Social Survey, 1942). In 1969, a survey carried out by the UK Margarine & Shortening Manufacturers' Association found that the food wanted more often was meat. The foods people most often thought they should eat less of were bread and potatoes.

In Britain, the National Food Survey is a prime source of dietary information, but it collects information on household purchases by income group, which makes it hard to elucidate social class differences. Nevertheless, it is clear that those with higher incomes ate a higher fat diet in the 1970s (DHSS, 1978). Prior to the interest in dietary 'excesses' in the 1980s much of the research was on the adequacy of children's diets with higher intakes of nutrients /1000 kcal seen as a 'better' diet. This was sometimes found to be eaten by the children from the higher social classes (Cook et al, 1973), (Jacoby et al, 1975) or sometimes not (Hackett et al, 1984), (Durnin et al, 1974). There is data for the diets of the NSHD members at age 4 in 1950. Comparing total fat and fibre intakes according to father's social class (using a t-test) suggests that boys and girls from non-manual households were eating significantly more fat and fibre, but there was no difference in the proportion of fat in their diets.

More recent studies have found that children or adolescents with higher socio-economic status parents have better eating habits (measured by eating three balanced meals a day) (Wickrama et al, 1999), (measured by eating more low fat and high fibre foods) (Sweeting et al, 1994). The effect of background continues into young adulthood, e g in 1992 butter use in Finns in their 20s increased as parental education decreased (Leino et al, 1999).

In adulthood those from higher socio-economic groups are generally seen as eating a healthier diet, as they have higher intakes of fibre, vitamins and minerals despite the fact that higher socio-economic status women often eat a higher proportion of fat (Hulshof et al, 1991), (Braddon et al, 1988). Another study measuring intakes of low fat and high fibre foods found non-manual status and being female associated with a better diet (Anderson, Hunt, 1992). This study also found 'almost half of the 35-year old population

of the Central Clydeside conurbation are consuming a healthy diet' (Anderson, Hunt, 1992), which is somewhat surprising given the much lower numbers found hitting the NACNE or COMA targets. Sometimes there is a mix up between cause and effect, 'health workers are aware that the very people who have the most to gain by improving their diets are those in social classes IV and V, who suffer from an excess of mortality from most causes' (Mooney, 1990), which sometimes seems to lead to foods perceived as being eaten by 'lower' social classes as being assumed to be unhealthy.

This evidence is not easy to assess as it comes from several countries with potentially different traditions. The criteria for healthy eating vary, as do the proportion of healthy eaters, and their characteristics. Historically the non-manual were undoubtedly eating more fat and fibre. So, measures focusing on fibre, e.g. fruit, vegetables, will always find the non-manual eating 'healthier' diets, but this does not necessarily mean the non-manual have changed to healthy eating more quickly, or that in all ways they eat a healthier diet.

7.5 Measures

Measures used for explanatory categories are described in general in the chapter 3 and in detail in Appendix A. In keeping on with the hypothesis (§3.6.1) they are considered in four categories; education, social circumstances, image and background. All this analysis is based on nutrient intakes. These were obtained from diet diaries of food intake which were converted into nutrients based on standard tables and are described in more detail elsewhere (Braddon et al, 1988). People excluded from this analysis on the grounds of not being typical were diabetics, and those for whom their diet diary in 1982 did not represent their normal diet. For example, they were working night shifts, or their diary recordings did not look like a number of complete days. 88 people cases were rejected on this basis in 1982 (10 diabetics and 72 atypical diaries) and 35 diabetics in 1989. Most filled in their diet diaries for the full 7 days. the others were suitably extrapolated. Data for the few who missed up to four days has been multiplied up.

7.6 Data quality and missing data

As explained in the section on missing data (chapter 3.6.4) missing diet data occurs in two main ways; either the NSHD member was not contacted at all, or they were contacted but did not fill in their diet diary. The NSHD members who were contacted have remained broadly representative, so the issue is are the people who did not provide diet diaries different, and if so what effects will that have?

Women, who only provided a diet diary in one of 1982 and 1989, had significantly lower intakes of fat, fibre, calories and salt compared with those who filled in diet diaries in both years. Men who only provided one diet diary had lower intakes of fibre. However, the important question is what relates to higher or lower intakes, not the absolute levels So the issue is did the people who did not provide diet information have a different relationship with the measures of interest, e.g. did a churchgoer who filled in their diet diary have a different diet from the churchgoer who did not? This was checked by looking for inter-actions between filling in a diary in 1989 and all the measures of interest for intakes in 1982, using analysis of variance. For women there were very few significant interactions, suggesting at least that those who stopped filling in their diet diaries did not differ in their eating patterns along the dimensions of

interest. For men there were a few significant inter-actions, but hardly more than might have occurred by chance, thus providing some re-assurance.

Collecting diet data is always a compromise between keeping it simple enough to obtain a representative sample, and obtaining data accurate enough to be useful. In the interests of simplicity NSHD used 7-days made up of 2 day recall and 5 days prospective, but did not ask participants to weigh their food. Broadly the overall figures on intakes are similar to several other contemporary UK studies (Fehily et al, 1990). In health behaviour there is the problem that 'accounts of health behaviours .. often bore less relationship to what they actually did in their daily lives than traditionally might be assumed' (Backett, 1990). In particular given the social pressures surrounding body size and gluttony there is evidence that a substantial minority do not report their diet accurately (Pryer et al, 1997), (Price et al, 1997), (Cook et al. 2000). In various studies smokers, those with high BMI, women, manual women and men on benefits have been found more likely to under-report (Price et al, 1997), (Pryer et al, 1997), (Cook et al, 2000). Under reporting affects some foods more than others, and is more pronounced for fat related intakes than fibre intakes (Pryer et al, 1997), (Cook et al, 2000). Given that under-reporting is concerned with presenting oneself in a better light, what and how much is under-reported may vary as dietary fashions change. Though it also shows how little understood was the health education message, as so few reported themselves as eating the recommended diet. Under reporting may have become more extensive as there is a greater emphasis on a healthy diet than there was in the early 1980s. As a result, absolute intakes should be interpreted with caution and fibre intakes are possibly less distorted than fat related measures.

7.7 Analysis

The aim of this research is to compare behaviour with public health recommendations, so the obvious candidate for an outcome is following the NACNE or COMA guidelines. Measuring following the short-term NACNE recommendations in terms of fat (as less than 34% of total energy), fibre (as more than 25g/day), salt (less than 11g per day), sugar (less than 34kg per year) found less than 1% of NSHD members met all those criteria in 1982 and less than 4% met the first three in 1989. Measuring the COMA recommendations simply in terms of a fat intake of 35% of food energy or less found 7.2% achieved it in 1982. Power analysis indicated that rather larger sample sizes (2500-20,000) than are available would be needed for any reliable logistic regression with such rare outcomes. Preliminary adjusted analysis using these criteria in 1989 found fewer measures than might have occurred by chance, though it was having a spouse who had stayed on at school for men and not having any children for women.

However it would be invalid to conclude that because the COMA and NACNE recommendations were unrealistic that people did not try to follow the health message, or that some groups were not more successful than others. It is a question of finding a more realistic outcome that discriminates between those who changed and those who did not. This was approached firstly by considering the elements of the COMA and NACNE outcomes and secondly what people understood as dietary change.

COMA and NACNE use different definitions (§7.2), which makes a difference to who meets their criteria. Total energy intake is confounded by alcohol intake, which is higher for men. Men eat more so they have higher fibre intakes (Gibney, 1990), (Cade, Booth, 1990), but the fibre targets do not distinguish between

men and women. COMA considers fat in the diet as a proportion of total food intake (i.e. excluding alcohol), while NACNE considers fat in the diet as a proportion of total calories (i e. including alcohol). Those with a higher alcohol intake are more likely to meet NACNE criteria, and have been found to do so (Gibney, Lee, 1991). In 1982 men in the NSHD with a fat intake of 34% or less of total energy, or of 35% or less of food energy were significantly more likely to drink more than 3 units per day. For women a fat intake of less than 35% non-alcohol energy was significantly associated with drinking less than 2 units a day, while a fat intake of less than 34% of energy was significantly associated with drinking more than two units a day. In 1982, 6.2% of men had fat as less than 35% of non-alcohol energy and 17.7% had fat as less than 34% of total energy. The equivalent figures for women were 8.2% and 8.6%. In 1982, 5.5% of women ate more than 25g of fibre a day, while 15.7% of men did.

Table 7.1 shows mean nutrient intakes and weights for men and women in 1982 and 1989, at ages 36 and 43 respectively, and whether there is a significant difference between 1982 and 1989 values using a t-test. Before carrying out any analyses, some variables were transformed to allow for skewness. A log10 transform was applied to men's fibre intakes and women s weight, while a square root transform was applied to women's fibre intake, and both sexes salt intake. %Fat was not transformed as it was not unacceptably skewed and most commonly used transformations, such as log or square root, made it worse. Overall, the general trend is increasing nutrient intakes, which superficially is quite surprising. However, these changes are consistent with the significant increase in weight. It is possible that these differences could be distorted if the people who disappeared between 1982 and 1989 were eating less. However, the analyses are based on those who filled in diet diaries in both 1982 and 1989.

Table 7-1: Mean Nutrient Intakes in 1982 and 1989 for men and women

	Men			Women		
	1982	1989	Significance	1982	1989	Significance
%fat of total energy	38.4%	38.3%	Ns	40.5%	38.7%	P <.001
%fat of food energy	41.2%	41.2%	Ns	41.7%	40.5%	P < 001
Fat (gram/day)	102.7	105	Ns	75.9	79.8	P <.001
Fibre (gram/day)	19	20.2	P < 001	15 1	17.6	P < 001
Total calories	2404	2430	Ns	1681	1807	P <.001
Salt (sodium/day)	3080	3195	P < 001	2191	2386	P <.001
Height (metres)	1.75			1.62		
Weight (kilograms)	76.3	79 0		62.5	66.3	

For men %fat intakes, total fat intakes and total calories are not significantly different in 1982 and 1989. Salt and fibre intakes are higher in 1989, i e salt is going in an unhealthy direction, fibre is going in a healthy direction

For women fat, fibre, total calorie and salt intakes all increased significantly between 1982 and 1989, while fat as a percentage of energy decreased. Salt is going in an unhealthy direction. Fibre is going in a healthy

direction (and has increased faster than the general increase in calories). The direction in which fat is going depends on how it is measured It is arguable that women may well have felt they have followed the health message because they altered the composition of their diets. On the other hand it is hard to believe that increased fat intakes, even if part of a slightly healthy balance are exactly what was intended

To get a better understanding of what the NSHD members understood as changing their diets, nutrient intakes were compared with answers to the question asked in 1989. 'Have you changed your eating habits since you were 36 years old?' Allowing for 1982 intakes, as a covariate in analysis of variance, 1989 intakes of fibre, total fat and the proportion of fat were significantly different between those who thought they had changed and those who did not. Salt intakes were the same for both groups. This may be because salt intakes are largely non-discretionary (Shepherd, Farleigh, 1986). Total calories were the same for women but lower for men who thought they had changed their eating habits

Table 7.2 shows nutrient intakes in 1982 and 1989 for men and women according to whether they thought they had changed their diet. Men who thought they had changed significantly increased their salt and fibre intakes, significantly decreased their %fat intakes and did not change their fat or totals calorie intakes. Men who did not think they had changed significantly increased all intakes apart from fibre. Women who thought they had changed increased their salt intakes, total calorie and fibre intakes, decreased their fat%s and did not change their fat intakes. Women who thought they had not changed increased fat, fibre, calorie and salt intakes and decreased their percentage fat. However, these changes in fibre intakes or the proportion of fat in the diet are a lot smaller in scale than those recommended by NACNE or COMA.

Table 7-2 : Mean nutrient intakes in 1982 and 1989 according to whether people thought they had changed their diet

	Men						Women					
	Changed eating habits			Not changed eating			Changed eating habits			Not changed		
Year	1982	1989	Sign	1982	1989	sign	1982	1989	Sign	1982	1989	sign
°ofat in total energy	38 7	37.9	01	38.2	38.7	.05	40.4	37.9	.001	40.7	39.8	.01
°ofat of food energy	41 4	40 8	05	40 9	41 5	.01	41.7	39.7	001	41 8	41 6	Ns
Fat (gram/day)	103 7	102 1	Ns	101.5	107.8	.001	75 3	77 2	Ns	78 1	83 4	.001
Fibre (gram/day)	19 4	21 4	001	18 6	19 1	Ns	15.3	18 2	.001	15 1	16 7	.001
Total calories	2405	2382	Ns	2396	2479	.05	1668	1780	001	1718	1844	.001
Salt (mg sodium/day)	3091	3198	.01	3053	3185	.01	2182	2384	001	2216	2392	.001

Hence meeting the COMA or NACNE recommendations is a composite measure whose constituent parts (fat, fibre, salt, sugar intakes) are not behaving consistently, and where only some of the constituents: i.e. fat and fibre, are seen as relevant. The perception of the health message on fat looks like a compromise, in line with the ideas on dietary balance; i e. improve the composition of the diet without reducing total fat intakes. Any choice of baseline in 1982 or amount of change deemed healthy by 1989 is arbitrary, because meeting the NACNE or COMA recommendations is unrealistic. This means that any split of intakes into 'healthy' and 'unhealthy' is arbitrary, and probably meaningless to those involved. There is a risk that any findings based on an arbitrary split are an artefact of where the split was made.

In view of all these problems with reliability and useful outcomes a simplified technique was used to establish what was related to a few, key aspects of nutrient intakes, without trying to build up a model over time. The measures of intake chosen were %fat in food and fibre intakes. These were chosen because they were a key part of the health education message and they bear some relationship to how people thought they ought to be changing their diets. Fibre intakes were used rather than the density of fibre in the diet, because it is closer to the health education message. Fat as percentage of food energy was chosen in preference to total fat, because the health message was about and understood more as changing the composition of the diet than changing total intakes. It was chosen in preference to fat as a proportion of total intake (see previous comment on alcohol §7.7), to save distortion by the heavy drinkers. The proportion of fat in the diet was chosen rather than the proportion of unsaturated fat for simplicity and because outcomes related to polyunsaturated fats are investigated more often.

A reduced set of explanatory measures was selected, representing the categories in the hypothesis, i.e. education, social circumstances, image and background. The reduced set of measures was based on what had been associated with other behaviours most strongly and ensuring there was as good a measure as possible for every category. The measures selected on this basis for each category were :

- Education – level of education, spouse's school leaving age for women at 36, and spouse's level of education for men and women at 43
- Circumstances – income, home ownership, marital status, number of children, depression, unemployment, membership of clubs and associations at 36 only
- Image – sociability, gender-identity, religiosity in adulthood, conformity at 15
- Background – current social class , father's social class for men, and mother's educational level for women

Analysis of variance was used to look for differences in average intakes between groups, only looking for main effects. Fibre and %fat were analysed separately rather than together in an adjusted analysis of variance because it was not assumed that they are mediated in the same way, and fibre intakes may be reported more accurately. Under-reporting was allowed for by classifying the NSHD members as under-reporters or not, and including under-reporting status in the analysis of variance. An NSHD member was classified as under-reported if their total calorie intake was less than 1.1 times the energy requirements for their basal metabolic rate (BMR), as has been done previously for the NSHD (Price et al, 1997). BMR was calculated based on weight, height, age and sex using the Harris-Benedict formula (Harris, Benedict, 1919). Assumptions for analysis of variance were met as far as possible, i.e. intakes were transformed to reduce skewness, and most of the analyses did not violate any assumptions about equality of variances between cells (using Levene's test and 5% significance). As is often the case with observational data the cells are not equal sized, although as interactions were not being calculated that matters less.

This approach has the advantage that it makes full use of the intake values instead of making an arbitrary split, but it does not make full use of the longitudinal nature of the data, or uncover potential pathways over time. However given the lack of a validated measure of a 'healthy' diet, the concerns over data quality, the novelty of the hypothesis and the problems encountered with a more complex approach, it is

reasonable to start with a very simple approach, and then if that yields useful results it could be developed further on another occasion.

As before fibre intakes were transformed to correct for skewness. The tables of results show the significance levels for the transformed variables, but for the sake of interpretability the means of the untransformed values; in reality the transformations make little difference to significance levels. These means may or may not be representative of the UK population at large in 1980s, because they have not been weighted to allow for the original composition of the NSHD. The means are provided to illustrate the scale and direction of differences between groups.

7.8 Results

7.8.1 Fibre Intakes

7.8.1.1 Men's fibre intakes in 1982

Table 7.3 shows the measures significantly related to men's fibre intake in 1982. Unemployment came close to being significant with the unemployed eating less fibre. Current social class was not independently significant, and did not change the significance levels or the means of the measures shown.

Table 7-3: Adjusted means for men's fibre intakes in 1982, allowing for under-reporting

Category	Measure		Mean	Significance
Education	Has O levels or more	Yes	19.8	
		No	18.3	P< .000
Social Circumstances	Depressive symptoms	Yes	16.9	
		No	19.0	P < .05

7.8.1.2 Men's fibre intakes in 1989

Table 7-4: Adjusted means for men's fibre intakes in 1989, allowing for under-reporting

Category	Measure		Mean	Significance
Education	Has O levels or more	Yes	20.1	
		No	18 1	P<.000
	Spouse with qualifications	Yes	19.2	
		No	18 5	P<.05
Social circumstances	Owns own home	Yes	19 1	
		No	17.8	P <.000
Image - sociability	Friends round weekly or more	yes	17 8	P < .000
		no	19.1	
Image - Religiosity	Takes part in religious activities	yes	19.9	P <.000
		no	18 7	

Table 7.4 shows measures significantly associated with men's fibre intakes in 1989. These are education, home ownership and the sociability and religiosity aspects of image. Social class just fails to be significant with the non-manual group eating less fibre. This difference disappears when total calories are allowed for, suggesting it is because the manual group eat more.

7.8.1.3 Change between 1982 and 1989 in men's fibre intakes

The difference between the measures associated with fibre intakes in 1982 and 1989 are a greater influence of education, economic circumstances, and the appearance of church going and sociability. Whether these measures represent change was checked by running an analysis with all the significant measures for 1982 and 1989 and seeing how these related to 1989 fibre intakes allowing for 1982 intakes as a covariate. Considering all these together, more education and lack of sociability in 1982 were associated with healthy change by 1989.

7.8.1.4 Women's fibre intakes in 1982

Table 7.5 shows women's fibre intakes in 1982. Higher fibre intake in women in 1982 is associated with more education, both positive and negative aspects of social circumstances, i e. lower income and home ownership and the religiosity aspect of image. Social class is not independently significant. Sociability is significant if measured at age 15, with as in previous cases, the more sociable eating less fibre, it is not significant if measured in 1982. The picture for women's fibre intake is very similar to men's in 1989.

Table 7-5: Adjusted means for women's fibre intakes in 1982, allowing for under-reporting

Category	Measure		Mean	Significance
Education	Has O levels or more	Yes	15.9	
		No	14.9	P<.005
Social Circumstances	Low income or none (own)	No	14.7	
		Yes	15.4	P<.05
	Owns own home	Yes	15.5	
		No	14.2	P<001
Image - Religiosity	Takes part in religious activities	yes	16	P< 005
		no	14.8	

7.8.1.5 Women's fibre intakes in 1989

Table 7.6 shows the measures significantly associated with women's fibre intake in 1989 These are education, home ownership, not having children, sociability, religiosity and background. Spouse's educational level just fails to be significant as associated with eating more fibre. Social class is not independently significant. These associations are not the results of eating more as allowing for total calories makes no difference.

Table 7-6: Adjusted means for women's fibre intakes in 1989, allowing for under-reporting

Category	Measure		Mean	Significance
Education	Has O levels or more	Yes	18.5	
		No	17.2	P< 005
Social Circumstances	Owns own home	Yes	17.9	
		No	15.6	P< 000
	Children at home	No	19.1	
		Yes	17 4	P< 005
Image - Sociability	Frequent social contacts	yes	16.4	
		no	17.8	P<.05
Image -Religiosity	Takes part in religious activities	Yes	19.0	
		no	17.2	P<.000
Background	Mother went to secondary school	No	17 2	
		Yes	18	P<.05

7.8.1.6 Changes in women's fibre intakes between 1982 and 1989

The overall picture for fibre intakes in 1982 is similar to 1989, education, circumstances and aspects of image are all relevant. However not having children, sociability and mother's education are significant in 1989, when they were not in 1982. Measures from 1982 or earlier associated with a higher fibre intake in 1989, allowing for fibre intakes in 1982, are more education, home-ownership, not having children and religiosity. Sociability just fails to be associated with change; it is if a 1989 measure of sociability is used.

7.8.1.7 Men compared with women

In 1982, fibre intakes for men and women do not present very similar pictures. Higher fibre intakes for men are associated with more education and depression, while for women they are associated with education, home ownership, lower income and religiosity. When men and women are considered together the measures of depression, home-ownership and church going all interact with sex (below a significance level of .1) suggesting that men and women's behaviour was at that time mediated in different ways.

However, by 1989 fibre intakes for men and women look much more similar with more education, home-ownership, less sociability and religiosity related to higher intakes for both sexes. For women not having children and mother's education are also significant. Not having children interacts with sex, suggesting this represents a difference between men and women.

7.8.2 Fat intakes

These fat intakes show the proportion of fat in the diet in 1982 and 1989 allowing for under-reporting. In the NSHD under-reporters usually report a lower proportion of fat in their diets, so adjusting these figures makes them higher.

7.8.2.1 Men's fat intakes in 1982

Table 7.7 shows measures related to %fat intakes in men in 1982. Of the measures selected only sociability and parental social class were found to be significant and are shown. Unemployment just fails to be significant with the unemployed eating a lower %fat. Education just fails to be significant as those with an educated spouse eating a higher %fat. Social class has no independent effect. This model explains little of the variation in fat intake. It does not show the better educated or the non-manual as having a healthier fat intake in 1982.

Table 7-7: Adjusted means for men's %fat intakes in 1982, allowing for under-reporting

Category	Measure		Mean	Significance
Image - sociability	Friends round weekly or more	Yes	41.8%	
		No	40.9%	P< .005
Background	Father non-manual	No	40.8%	
		Yes	41.7%	P< .000

7.8.2.2 Men's fat intakes in 1989

Table 7.8 shows the measures associated with men's %fat intakes in 1989. Little was found to be relevant to men's fat intakes in 1989, with the exception of education and social class. A model with education is shown, because it was a stronger relationship and just failed to be independent of current social class. However, it is a very fine distinction. This model explains little of the variation in fat intake. Little is associated with a lower proportion of fat, barely education, not home-ownership, barely social class. These results could represent the start of a trend towards the more educated or the non-manual eating a lower fat diet, but that remains to be checked in the 1999 data.

Table 7-8: Adjusted means for men's %fat intakes in 1989, allowing for under-reporting

Category	Measure		Mean	Significance
Education	Has O levels or more	Yes	40.5	
		No	41 2	P <. 05

7.8.2.3 Changes in men's fat intakes between 1982 and 1989

Unadjusted, both social class and education are associated with changing to healthier %fat intakes by 1989 Considering education, current social class and sociability together, education just fails to be significantly associated with change to lower fat intakes, whilst social class is not. It would be best to look at these relationships again with the 1999 data for the NSHD to confirm that it is education rather than social class mediating change.

7 8.2.4 Women's fat intakes in 1982

Table 7.9 shows %fat intakes for women in 1982. Lower % intakes are associated with home ownership, depression, not being in a male occupation, a less educated mother and current manual social class. In

1982, there is little indication of lower %fat intakes being independently associated with education or non-manual social class.

Table 7-9: Adjusted means for women's %fat intakes in 1982, allowing for under-reporting

Category	Measure		Mean	Significance
Circumstances	Owns own home	Yes	41.4	
		No	42.4	P < .05
	Depression symptoms	No	41.7	
		Yes	40.3	P< .005
Image – gender-identity	In male dominated occupation	Yes	42.7	
		No	41.6	P< .05
Background	Mother went to secondary school	No	41.3	
		Yes	42 2	P< .005
	Social class non-manual	Yes	42	
		no	41.3	P < .05

7.8.2.5 Women's fat intakes in 1989

Table 7.10 shows measures associated with lower %fat intake in 1989 for women. These are home-ownership, not having children and church going. Sociability and masculinity both just fail to be significant in the expected directions, i.e. as sociability and masculinity associated with a higher %fat intake. Neither social class, nor education are independently significant. Allowing for alcohol intake makes no difference.

These are a subset of the measures associated with fibre intakes for women in 1989. However, the beneficial effect of education and background seen for fibre intakes are not evident for fat intakes. The negative effect of children accords with the lay observation that children prefer, and at younger ages need a higher fat diet.

Table 7-10: Adjusted means for women's %fat intakes in 1982, allowing for under-reporting

Category	Measure		Mean	Significance
Circumstances	Owns own home	No	42 1	
		Yes	40 2	P< 000
	Children at home	No	39.3	
		Yes	40 7	P< .005
Image – religiosity	Takes part in religious activities	No	40 8	
		yes	39 3	P< 000

7.8.2.6 Changes in women's fat intakes between 1982 and 1989

The difference in measures related to fat intakes in 1982 and 1989 is that depression, female occupation and depression are no longer associated with a lower %fat intake, while having children at home and lack

of religiosity are associated with a higher %fat intake. An analysis of %fat intake in 1989 allowing for %fat intake in 1982 was run using measures found to be associated with (or almost with) fat intakes in 1982 or 1989. Healthy change was associated with 1982 measures of not having children and religiosity. Femininity in 1982 just failed to be related to healthy change. Background measures such as social class and mother's education were not related to change. This could be because 1989 represents a transitional point between these measures being associated with a higher fat diet in the past, and possibly a lower fat diet in the future. This remains to be determined using the 1999 data.

7.8.2.7 Men compared with women

Comparing men and women's fat intakes in 1989, these are mediated by different measures. For men it is more education associated with lower fat diets, whilst for women these sorts of background measures which were relevant in 1982, have been replaced by home ownership, no children and religiosity. In a combined model home-ownership, churchgoing and having children at home all interact with sex, suggesting these have different effects for men and women.

7.9 Discussion

Somewhat surprisingly given the initial difficulties with obtaining any understanding of this data analysing %fat and fibre intakes provides some insight into how and why change occurs. This discussion largely concerns adjusted relationships, i.e. the relationship found when allowing for measures in the other three categories. These results are not directly comparable with studies where the outcomes are items like the amount of fibre from fruit and vegetables or the proportion of %SFAs or their proxies such as the number of salads eaten a week or the use of polyunsaturated spreads. However the health education message in the 1980s was not specific about the source of fibre but was about the proportion of fat in the diet, so these do provide an insight into an important aspect of health related behaviour in the 1980s, which is not often considered, because of the difficulty and expense in collecting the relevant data. These results are also not generalisable to diet as a whole, though it is re-assuring that the few items found as associated with changing to meet the NACNE or COMA did also appear as associated with changing to healthier %fat and fibre intakes. These were education for men, and religiosity and not having any children for women.

A strength of this analysis is that it did allow for the under-reporting, which is known to affect dietary data However, this means that there are fewer other studies with which it is comparable, as identifying under-reporters requires additional data. In actual fact, allowing for under-reporters did not make much difference to the overall pattern of results on the outcomes considered, but that does not mean that it might not to other outcomes, where socially desirable answers are easier to provide, such as reports of food selection.

Because of the difficulties of analysing this data some aspects of childhood adversity and adolescent image were not considered. Aspects of childhood adversity not considered include parental divorce or parental illness and death, which could be on a pathway to educational achievement. So this analysis provides less insight than it might into why education is important. Aspects of adolescent image for gender-identity, sociability and religiosity were not considered In the rest of this thesis these have been found to be related to adult health behaviour, so not considering them has possibly under-played the role of image. As noted about the previous analysis chapters, analysing men and women separately has reduced the power of the

analysis, which may also have contributed to under-playing the role of image There were cases where an effect would have been detected if men and women had been analysed together.

These results provide more insight into women's eating than men's. The models for men explain even less variation and are less robust. This may be because men's eating habits are to some extent under the control of their partners. If the same sort of information were available on their partners it might be easier to understand men's eating habits. It could be that men did not respond to the healthy eating message. This would be in line with the overall image of healthy eating being an unmanly thing to do.

7.9.1 Education

There is little evidence for education being associated with a lower proportion of fat in the diet. It is possible that more educated men might be starting a trend for eating a lower fat diet. Ideally, that would require confirmation from the 1999 diet diaries. The reason for fat showing less association with education may be because historically eating a low fat diet has not been associated with wealth and by extension education, so a more radical change is required. It may be that change is very difficult to achieve. On the other hand, there are other aspects of health behaviour, such as drinking, where education is also not much associated with healthy behaviour.

There is evidence for education being associated with a higher fibre intake, for men and women, at ages 36 and 43. In a cross sectional analysis there is no evidence for the more educated being more responsive to the health education message, caring more about their health and changing faster. Using the longitudinal nature of the NSHD, education is associated with changing to eating more fibre.

Why education should be related to following one aspect of the health education message (fibre intakes) but not another (%fat intakes) is puzzling. It could be that the message on fibre intakes was easier to implement. It could be that people focused on changing their saturated fat intakes rather than the proportion of fat in their diets.

7.9.2 Social Circumstances

There is some evidence for material aspects of social circumstances being associated with healthier eating and mediating change. Home ownership is associated with eating more fibre and changing to eat more fibre. For women home ownership in 1982 is associated with higher fibre intakes in 1989. However home ownership represents more than income, as higher income, considering other significant measures, is if anything associated with lower fibre intake. However, as the analysis was comparing grouped means, this does not mean that low income is not a barrier to change, just that people with higher incomes did not change either.

There is little evidence that social support in the form of membership of clubs and associations, marriage or the presence of children is related to healthier intakes of fat and fibre. For women the presence of children is a barrier to improving their fat and fibre intakes, which is quite plausible, but is different from the finding that Finnish women with children ate healthier diets, though that was based on a multidimensional food index (Roos et al, 1998). Overall, these findings are consistent with the mixed

evidence to date (§7.3.2.2). They are also consistent with the qualitative observation that children and husbands exert a strong and not necessarily healthy effect on women's diets (Charles, Kerr, 1988). Maybe social support did not appear because one of the measures used related only to 1982, however marriage and the presence of children were used for both 1982 and 1989. Maybe it is simply that social support is simply not relevant to nutrient intakes, perhaps because eating is not usually a private activity rather than a group activity.

Stress was also considered as a potential explanation using a measure of depression from 1982. Depression was related to men eating less fibre and women having a lower %fat intake, but was not significant in any other way. This is not inconsistent with the indications of a rather complex relationship between diet and stress; i.e. some people eat more and some people eat less in response to stress. It maybe that a more precise measure of stress would have revealed more, so it cannot be ruled out. Neighbourhood could potentially have been a measure but there was not an historic measure of neighbourhood quality, so it cannot be ruled out.

7.9.3 Image

There is some evidence for some aspects of image being associated with healthy eating. Less sociability, femininity and religiosity are all associated with some aspects of healthy eating. Lack of sociability and religiosity in 1982 are associated with changing to healthier eating by 1989. On the other hand rebelliousness which has been seen strongly related to some other health behaviours did not feature here at all. This may be because healthy eating does not have a public image along that dimension or because the measure available only relates to childhood. Sociability was only considered for completeness so it is quite surprising that kept appearing (always in the same direction) when what could be thought of as an apparently similar measure (club membership) never featured. Sociability was also related to unhealthy eating in the same way as being more likely to smoke and drink more. Femininity was expected to be associated with paying more attention to diet and that was the case for women. Religiosity was associated with both eating a healthier diet at the outset and changing to a healthier diet. This is similar to what has been observed for other health related habits, and is exactly what would be expected from the public image. In some ways it is surprising that the measures of sociability, femininity and religiosity did turn out as useful, because they are ad hoc constructions which have not been fully validated. In particular the measure of femininity is making some very broad assumptions.

7.9.4 Background

Background looks like it is part of a rather complicated pattern. The starting point in 1982 corresponds to a time when those from a more privileged background were more likely to eat a higher fat diet, a more varied diet and more fibre It does appear that that the non-manual groups were eating a higher proportion of fat in 1982, but there is little evidence for the non-manual groups eating a higher fibre diet, apart from women in 1989. This may be because a more varied diet does not necessarily translate into higher fibre, given the fibre content of some staples, such as bread and potatoes. So, there is some evidence that dietary intakes are in line with long-standing historic trends If one were to take home ownership as representing social class allegiance, then the interpretation would be stronger. There is very little evidence that, independent of education, social class norms mediate following health education messages

8 DISCUSSION

8.1 Introduction

The health related behaviours of smoking, alcohol intake, exercise, fat and fibre consumption are targeted by public health in order to achieve reductions in risks to health. This thesis has been concerned with a new way of understanding what motivates some individuals to follow advice and others not. The method was conceptualized and then operationalised using data from a long-term longitudinal study, which spanned a period of change in advice about the 4 health related behaviours discussed. This chapter considers the validity of the methods developed in this thesis in comparison to the methods currently used to 'explain' conformity or otherwise with public health advice, some considerations in interpreting these results, the overall findings and their implications for further research and improving public health.

8.2 Approach

This research places the current explanations for health behaviour in a comprehensive theoretically based, multi-disciplinary framework, making it easier to compare explanations, and identify gaps. From health psychology there is the role of individual utility, i.e. the value to the individual of that particular behaviour usually conceptualized and operationalised in terms of the possession of individual psychological attributes (such as attitudes and beliefs), though sometimes extended to the possession of skills. From sociology there is the role of social structure and of agency (agency is engagement in a specific social context and temporal context, i.e. the role of cultural and social trends). The role of social structure is often conceptualized and explored by epidemiologists in terms of socio-economic circumstances (such as tenure) and social relationships (such as family and neighbourhood). Much research implicitly operates within this framework, with each discipline focusing on its particular area of interest. What is rarer is an explicit recognition of the whole framework, a recognition of the implications of placing health behaviour in this framework, and investigation based upon considering health behaviour from a theoretical perspective in relation to all these possible explanations, as they accumulate for an individual over the life course. Admittedly data for this type of investigation is not readily available.

A theoretical gap was identified from using a common framework in the explanations for health behaviour, which is the role of human agency, both in the here and now and over time. The existence of a gap is known (§2.2), (Lupton, 1994). To my knowledge no one has operationalised a way of filling it, and then tested that operationalisation with prospective data on health behaviour outcomes. In this research the role of agency in the here and now is based on Giddens' idea of self-identity, put forward as an untested rationale for behaviour (§2.3). Self-identity has been used before by health psychologists to mean 'the extent to which an actor sees him or herself fulfilling the criteria for a social role', and then used to see if people carry out behaviour congruent with that social role (Connor, Armitage, 1998). For example to see if a small number people who identify with the health consequences of diet had healthier diets regardless of all else (Sparks et al, 1995). However this is a simplistic ad-hoc approach which does not take into account the social context and presumably requires a different self-identity for each health behaviour: sportiness for leisure exercise, green consumer for organic food, and so on. In this research self-identity is used as a much broader construct to link the social context and the individual, based on a multi-dimensional concept

of image, with culturally relevant dimensions, on which both the public image of a health behaviour and an individual can be rated. Individuals whose own image on these dimensions matches the public image are expected to be more likely to carry out the activity in question. Four dimensions of image are used (taken from social anthropology and cross-cultural psychology), which can be applied to both an activity and an individual; these are conformity, sociability, gender-identity and religiosity (§3.2.1.2). Thus image in this research is used as generic underlying process linking any health behaviour to its social context, where the individual attributes measured and the process is the same for all health behaviours. The results, though, in terms of unhealthy and unhealthy behaviour may be different depending on the public image. This novel approach has made it possible to investigate the here and now aspect of agency in health behaviour using the concept of image, alongside the existing well-researched explanations.

The role of agency over time has been previously investigated to some extent in health behaviour using the concept of a diffusion process, i.e. broadly that younger and more educated people pick up and drop trends more quickly than others. Diffusion is usually offered as a retrospective interpretation of observed trends or is an interpretation that can be put on observed trends, concerning cigarette and alcohol use (§2.3.2.2.2), (Ferrance, 2001). It is also sometimes implicitly offered as a post-hoc observation that higher socio-economic status (SES) groups have changed faster than others on a range of health behaviours (Lindbladh et al, 1997). In this research the idea of diffusion has been extended to postulate that following trends is driven by status-seeking, thus explicitly providing a link between the social context, i.e. the state of the trend in the population and individual behaviour (§3.2.2). In this thesis the role of social trends is investigated consistently for all four health behaviours, using a generic process of identifying current trends for a health behaviour, identifying an individual's status and seeing if they match. As with image, it is a generic underlying process, in this case mediated by status. The results, though, in terms of unhealthy or healthy behaviour could be different, depending on whether that particular health behaviour is fashionable or not. This approach has made it possible to carry out a prospective investigation of the role of social trends in health behaviour, and compare with other existing explanations. To my knowledge it has not been done before.

This framework gives four major explanatory categories to consider - personal attributes, values and skills, social structure, image and social trends. The NSHD provides ideal data for exploring the role of all these categories. It is one group of people anchored in time and place, so it is possible to identify the trends and social context the members of the NSHD experienced, which would have been more complicated in a study covering a wider age range, or a range of cultures. It has a wealth of data covering the study's members skills and achievements, their economic and social circumstances, how they presented themselves and social status throughout life, and crucially data on health behaviour before and after health messages were promulgated Nevertheless, approximations have been used in the interests of making progress: education represents values and skills; social circumstances represent social structure; image represents the here and now aspect of agency; background, covering current and parental social class represents social trends. These terms have been used consistently throughout this thesis.

This theoretical framework suggests socio-economic status should be decomposed into education, material circumstances and social class. Potentially these represent different concepts, (respectively attitudes and/or

skills, means and status). The contribution of each one of these should be considered allowing for the others, to get a clear understanding of what determines behaviour, and hence what is best to target for change The richness of the NSHD data allows this analysis. This is different from many epidemiological studies looking at health behaviour. These often use education as an indicator of socio-economic status on the pragmatic basis that it is the best predictor, thus side-stepping the issue of what socio-economic status means. Some studies consider education and income (Brownson et al, 2000), (Caetano, Clark, 1998), (Droomers et al, 1998), (Flint, Novotny, 1997). A few studies consider social class and measures of material circumstances (Bartley et al, 1999). Very few studies consider education, material circumstances and social class together, though there are some (Graham, Der, 1999).

This research aims to take the argument a stage beyond empirical observations about associations between health behaviours and other factors to uncover the underlying mechanisms, including unpacking socio-economic status, the role of image and status to explain the interaction between behaviour and the social context. Considering the scope and ambition of this research (possibly misplaced) there are some considerations, which limit the interpretation of this research, which should be pointed out before the overall results are discussed.

8.3 Considerations

These considerations concern the theoretical framework, the outcomes considered, the limitations of the data, and questions that were not considered. These are discussed below.

8.3.1 Adequacy of the theoretical framework

A broad, inter-disciplinary framework was used to ensure all possible broad categories of explanation for behaviour were considered, and previous research used to identify the most important. However within this framework, there are some potential explanations which have not been considered, some which have not been considered as fully as they might have been and some where the attribution of an explanatory variable to one category or another is not ideal.

Some potential explanations not considered are genetics, neighbourhood, tracking and role modeling. Genetics and neighbourhood were discussed in chapter 2. Tracking is the stability of behaviour over time or the predictability of a measurement of a risk factor later in life for values of the same risk factor earlier in life (Twisk et al, 1997). Showing behaviour at one time depends on previous behaviours simply shifts the problem of understanding why the behaviour occurred at all, and does not explain why behaviour changes. So previous behaviour has not been used as a potential explanatory variable for current behaviour. Role modelling is usually considered in terms of similarity of behaviour between an individual's behaviour and that of their parents and peers. Role modelling has not been considered in that narrow way. However it has been considered in the broader context of either conforming or not to certain images and social trends.

8.3.1.1 Adequacy of the operationalisation of the framework

Inevitably in considering such a wide-ranging framework, compromises and fine distinctions had to be made. Education is used as a proxy for the health psychologists' measures of attitudes and values, such as

self-efficacy or locus of control, on the assumption that some of these are needed to acquire education. There is some indirect evidence for this assumption. One study found that 'healthy' behaviour precedes educational achievement, suggesting it could be the same underlying qualities, which lead to both outcomes (Koivusilta et al, 1998). However, education is at best only a partial representation of these concepts, so one cannot say whether including these would have changed the nature of the relationships found, and one certainly cannot comment on their relevance.

Health psychology, and specifically health education in adolescence is also based round some socio-emotional skills, such as competence and resilience, e.g. teaching decision making skills, refusal skills and assertiveness, which may give adolescents and one assumes adults greater capacity to manage their own behaviour and to follow health recommendations. These skills have been found to be associated with healthier behaviour in adolescents (Epstein et al, 2000a), (Conrad et al, 1992), (Derzon, Lipsey, 1999), (Epstein et al, 2000b), (Loveland-Cherry et al, 1996), (Jackson et al, 1997), (Scheier et al, 1997) (Sallis et al, 2000), (Dwyer et al, 1998). In retrospect with a clearer initial conceptualization, and a more imaginative and inventive use of the existing NSHD data it might have been possible to operationalise some of these concepts more precisely rather than simply using education as a marker for these skills too.

There are some measures of social circumstances particularly relating to hardship and adversity in childhood and adolescence, which were not considered as fully as they might have been. Some measures concerning family functioning were considered: parental divorce, parental illness and death, interests with parents. However, with the exception of the relationship between parental divorce and smoking, these measures did not reach significance in adjusted analysis, even when considering the relationship between childhood and adolescent variables and health behaviours, which eliminates the possibility of these not showing because they are related to something else such as lower educational qualifications which is also associated with health behaviour However it has been observed recently that those who suffered adversity in childhood, such as parental mental health problems, social problems, and child abuse are more likely to smoke in adulthood (Anda et al, 1999). So, maybe other markers of poor family functioning or adversity should have been considered. For example, in retrospect it might have been better to consider if the well-established parental bonding instrument (Parker, 1989) was related to adolescent smoking or any other adult health behaviour.

Turning to the measures of image, for most dimensions it was possible to find approximate measures to represent that attribute in childhood or adolescence. Most adolescent measures of image are based on teachers' assessments; this is particularly helpful in the context of this research which is about how people project themselves. In contrast the childhood/adolescent measure of religiosity is based on attending Sunday school and thinking you had a religious upbringing 20 years later. These are less precise measures of the concept. Sunday school attendance was an activity particularly favoured by the 'respectable working-class' (McLeod, 1996) Thinking you had a religious upbringing 20 years ago is open to all sorts of different interpretations. This may be why the childhood/adolescent measure of religiosity turned out to be less relevant than might have been expected from other studies showing a relationship between religiosity and healthier behaviour.

The adulthood measures of image are based on self-reports, and it was difficult to construct an adulthood measure of conformity. So it is possible that the role of conformity has been under-estimated. Given that there is now some evidence that image is relevant to health behaviour, it would be useful if information on dimensions of image continued to be collected in future studies of health behaviour, including adult conformity, preferably based on the assessments of knowledgeable others. Similar attributes for significant others such as spouse might also have a bearing.

As regards the way potential measures were assigned to explanatory categories, there are few other studies on which to base detailed classification of measures. Measures related to education, income and social class are straightforward to categorise Education is a measure of the skills acquired, and of the characteristics which are often needed to acquire skills, such as hard work, planning and self-discipline. Income is by definition a measure of material circumstance. Social class is by definition a measure of occupational status. Tenure and parental education are less easy to classify.

Superficially, tenure is a measure of material circumstances. However, there is evidence that tenure has an effect on health independent of income, leaving the difficult question of what exactly tenure means to people. Throughout the NSHD's lifetime owning one's own home has been strongly aspirational (Browne, 1950), as shown by the popularity of the Right to Buy scheme introduced in 1980, which has been used by 30% of tenants to buy their property (HoCL, 1999). It is possible that tenure is a marker of acquiring status, and as such a proxy for social class. Nevertheless, in this analysis tenure has been treated as a measure of material circumstances, not as a measure of social class, to ensure that material circumstances were given every chance of showing their role, and to ensure the categorisation did not create bias towards showing the hypothesis. However, in the analysis tenure behaved more like a measure of social class, and has often had an effect in the same direction as social class and the opposite direction to income. So, the categorisation chosen may have led to the underplaying of the role of social trends. Given that tenure is relevant to health behaviour, sometimes in an opposite direction to income, it would be useful to know why tenure matters, as it is hard to see that it is directly motivating. For example, it could be that owning one's own home is associated with planning for and optimism about the future. It could be that tenure is associated with living in a more salubrious and better appointed neighbourhood or it could be a status symbol

Parental education can either be considered as a measure of the level of education in the environment in which the NSHD member grew up, or a measure of the status of the family of origin. Other measures of the value placed on education in the parental home were considered, such as parental interest in school. Parental education fits with parental social class in that they both relate to long-standing attributes of the parents, concerning the NSHD member's family background. Parental education was treated as an indicator of parental status. In the adjusted analysis parental education and social class did sometimes turn out to be fairly interchangeable Substituting one for the other in the multiple regression models often made little difference to the other estimators or the effect of parental background. However using parental education to represent background may have overplayed the role of social trends. Given it is relevant it would be useful to unravel why It could be a representation of more than family background and status,

for example, that maternal education is related to more effective parenting (DeGarmo et al, 1999) and hence more chance of the child acquiring competence skills.

8.3.2 Outcomes

This thesis is concerned with understanding health behaviour, because ultimately the aim is to find more effective ways of changing health behaviour for the public good. For that reason this thesis has looked at health behaviour in the context of the contemporary health education recommendations, i.e. those in Britain contemporary with the data available on the NSHD, which is from the 1960s onwards on smoking and in the 1980s on drinking, exercise and diet. However those contemporary health education recommendations are not necessarily the same as the current ones in Britain or elsewhere, nor in the light of continuing research are they necessarily the same as current thinking on optimal behaviour for health.

Focusing on health behaviour in comparison with recommendations provides insight into responses to health education, and it is comparable with other studies that look at behaviour within the context of health education messages, even if the specific recommendations are different. However results are not directly comparable with studies which look at optimal behaviour for longevity and health. Specifically this study is possibly less likely to find 'unhealthy' behaviour among the more disadvantaged groups. Optimal behaviour for health is based on identifying the characteristics of those who currently live longer. As there is a steep social class gradient in life expectancy, it is possible that characteristics of the lifestyle of the most advantaged will be seen as optimal even if it is not the underlying reason. Consequently using optimality criteria the least advantaged are more likely to be seen as exhibiting sub-optimal behaviour.

Benefiting from the use of extensive longitudinal data, both initiation and change in health behaviours are considered, rather than being limited to prevalence. This gives more insight but it makes it harder to make comparison with other studies which are often restricted by the data available to look at prevalence rates at one point in time or to look for differential change in prevalence rates, which are not always easy to interpret.

This thesis focuses on the categories and establishing their role, particularly to establish the relevance or otherwise of image and social trends. However it has not considered how people acquire characteristics or skills, i e. what are the pathways that lead to educational success or to forming an image of oneself. This is because it only makes sense to consider potential pathways once it has been established that the end result has a bearing.

8.3.3 Analysis

This was to some extent exploratory data analysis, as it was not known what particular measures were going to be the best measures for a category, particularly for image dimensions. So a model selection technique was used This introduces several limitations. The cut-off of 5% significance is customary, but it is arbitrary as p-values are on a continuous scale. The strength of a relationship will depend on the measurement error, so it is possible that some variables have been excluded simply because they are more poorly measured than others This has to some extent been considered by pointing out where variables just failed to be significant and where on reflection some variables appeared to be suffering from measurement

error. In addition to try and ensure that all the variables were at the same level of precision, and therefore had an equal chance of meeting the model selection criteria, all the variables were dichotomized. because some of them only took two values, for example home ownership or having religious belief. This has several effects. Some explanatory power was lost and the amount of variance that could be explained was reduced, particularly when trying to explain behaviour over a long-time period. The amount of variance explained is usually quite low, and the effect of a measure (size of the odds ratio) is usually quite small, and probably smaller than it might otherwise have been. However one does not in epidemiology expect to explain much of the variation. The fine grain of some relationships may have been lost, where different levels of a variable did exist but were not used, for example, different levels of income, or numbers of children, or long-term unemployment compared with current unemployment and employment. All in all findings should be interpreted as indicating that a particular category is relevant, without paying too much attention to exactly how much, or exactly which measure it happens to be.

A model selection technique was chosen because the aim was to determine which of a large range of variables were significantly related to health behaviour when considered together, when some of them had not been considered before. Another approach would have been to construct a much more precisely specified model from the theoretical framework. Such a model would have avoided problems with the statistical selection of measures into the model, but would have involved problems with the a priori basis on which variables were selected, i.e. what to choose given the large range of concepts and variables in use to explain health behaviour, and whether to choose the same set for men and women. These variables are not often considered together, from the point of view of what is the best measure of a particular concept, such as a dimension of image or a measure of social support. So it would not have been necessarily obvious which variable to chose, and one would have been open to the criticism that a particular category was not seen as relevant because the wrong measure had been chosen, not because it really was irrelevant. Another potential approach would have been to take a more traditional epidemiological line and have started with aspects of image and then added in measures of all 'known' risk factors as potential confounding factors. Again the problem here is as before, selecting what all these known risk factors are, as almost all the variables included in this research have been found to be relevant to health behaviour, but they are not all independent measures of different concepts, so one would be back with a selection procedure. In these circumstances a model selection technique treating men and women separately appeared to be the most practical way forward. However in general it would be helpful if there were a standardized set of concepts in use for explaining health behaviour, with clear definitions, and agreement on the best way of measuring each concept.

8.3.4 Data

These findings are based on one group of people in one place and time. The NSHD was and has remained representative of the British born population of Great Britain, and the multivariate analysis presented is based on data, which is usually representative of the original social composition of the NSHD.

The NSHD is an observational study, so although it is possible to test a rich theory, and generally the sample sizes are large enough to have reasonable power, there are cases where the number of people who fall into one category or another is too low, either to be able use the variable as an explanatory variable or

to be able to look at some outcomes. This potential issue with explanatory variables was to some extent avoided by choosing definitions, such that when a variable was dichotomized a reasonable proportion fell into the smaller group. However there were a few cases where the factor of interest, such as parental divorce, unemployment, depressive symptoms or some aspects of image did not occur very often, so it is possible that these might have reached significance in a larger sample Overall, this may have under-played the role of adversity and image. Finally there were some outcomes which occurred less often than one would have liked to achieve reasonable power. This is a disadvantage of using following health education advice as an outcome. There were some outcomes which the vast majority was following such as women drinking within the 'low-risk' limit. There were other outcomes, such as dietary recommendations very few were following. Using an outcome such as who falls into the bottom third of any distribution for say alcohol and dietary intakes avoids this statistical problem, but loses the link with the health education message. In the event women drinking was considered in terms of the health education message, for consistency with men. But dietary intakes could not be compared with the health education message. The analysis of diet fits least well with the aims of this research.

8.3.5 Issues not considered

It is possible that there is some underlying mechanism which motivates people to care about their health, and motivates people to carry out all health behaviours, in which case there would be some explanation for why some people have healthier lifestyles than others overall on a composite index of several health behaviours, which would be tested by considering a combined outcome. A combined health behaviour index was not considered, for the following reasons. Considering a combined outcome is logically inconsistent with the premises of this thesis. This thesis assumes that health behaviours such as smoking, drinking, diet and exercise are embedded in the fabric of people's lives and their use is determined by more than considerations of health, instead it is determined by underlying mechanisms which are not necessarily driving all behaviours in the recommended direction at the same time. For example although the conformity and religiosity aspect of image were expected to be and were found to be associated with the recommended behaviour on all four behaviours, sociability and gender-identity were not expected to be and were not found to be. An analysis of a combined behaviour outcome would have been difficult to interpret. The concept of an underlying mechanism that motivates people to live a healthier lifestyle has been evaluated by considering the role of education and somewhat unsatisfactorily competence and resilience as factors which promote recommended behaviour on all outcomes. However this has not been considered in the context of a combined outcome because of the potentially confusing effect of all the other possible explanations, potentially going in different directions.

Another possibility which has not been considered is one health behaviour as an explanation for another, i e. smoking was never considered as a reason for not exercising, or exercising as a reason for drinking. This was not considered because it is not relevant to understanding why people carry out one health behaviour or another; it could have ended in an endless and meaningless chain of one behaviour explaining another, without any idea of why any of the behaviours occurred. However, it would be relevant in a different context; for example, if the research aim was to identify who was particularly at risk of unhealthy behaviour, then knowledge of other related health practices might be relevant, or if it was to identify who was at higher risk because they performed several unhealthy behaviours, or if one wanted to know whether

the risks were independent. However, that is not to say that unhealthy behaviours do not cluster; some do (Hulshof et al, 1992), (Mattisson et al, 2001). This research, however, is about the underlying reasons why behaviours cluster; for example the more sociable are more likely to both smoke and drink, so smoking and drinking may well go together.

8.4 Overall Findings

Table 8 1 shows the relationships between the explanatory categories and 'healthy' behaviour in multivariate models of measures selected as significant. In these models the categories are usually independent (chapters 4-7), so the table is indicating where relationships exist allowing for the other categories. Table 8.1 shows both behaviour at the start of the period (row labelled (b) for baseline) and change during a period of health education (row labelled Δ).

The definitions of 'healthy' behaviour are following the contemporary recommendations. The baseline is health behaviour at around the time when the health education recommendations on that behaviour started to be promulgated. That is not being or not having been a smoker by age 20 in 1966, not drinking at more than the 'low-risk' level at age 36 in 1982, taking some leisure exercise at 36 in 1982, and eating more fibre and a lower proportion of fat at age 36 in 1982. Change is moving towards these recommendations, i.e. giving up smoking between 1966 and 1982, or giving-up between 1982 and 1989 allowing for smoking status in 1982, or change towards these recommendations between 1982 and 1989 for drinking, exercise and diet.

The hypothesis is that more education and better social circumstances (i.e. more material resources, more social support and a non-depressive state) should be associated with healthier behaviour. A view of self in line with the current public image of the relevant behaviour should be associated with carrying out that behaviour. Conformity should be associated with not smoking, 'low-risk' drinking, exercise and possibly a better diet. Sociability should be associated with smoking, more than 'low-risk' drinking, taking exercise and possibly eating more. Masculine gender-identity should be associated with smoking, more than 'low-risk' drinking, taking exercise and a less healthy diet. Religiosity should be associated with not smoking, not more than 'low-risk' drinking, taking exercise and eating a healthier diet. Those at the forefront of following a social trend, hypothesized to be determined by status measured by social class, should be more likely to be carrying out fashionable behaviour. Trends in smoking in 1966 were less smoking for non-manual men, and a transition point for women, with non-manual women following non-manual men more by the 1980s. Trends for alcohol use in 1982 and in the 1980s were more drinking for non-manual women, and possibly less for non-manual men. Trends for taking exercise in 1982 and in the 1980s were for more non-manual men and women to be taking more exercise. Trends in diet in 1982 and in the 1980s were for non-manual men and women to be eating more fibre and a higher proportion of fat.

Table 8-1: Summary – relationships between explanatory categories and the initiation of (b) and change to (Δ) recommended health behaviour.

Category	Dimension and direction		No Smoking		'low-risk' Drinking		Taking Exercise		'Healthy' Diet	
			M	W	M	W	M	W	M	W
Education		b	↑	↑	↓		↑	↑	↑	↑
		Δ	↑	↑	↓	×	↑	↑	↑	↑
Social Circumstances	Better Material Circumstances	b			×	↓	↑	↑		×
		Δ	↑	×	↓	↓	↑	↑		↑
	More Social Support	b	↑	↓	×		↑	↑		
		Δ	↑	↑	↑	↑	↑	↑		↓
	Stress	b							↑	↓
		Δ		↑						
Image	Conformity	b	↑	↑	↑					
		Δ	↑	↑	↑					
	Sociability	b		↓	↓	↓	↑	↑	↓*	
		Δ		↓	↓	↓	↑	↑	↓*	
	Feminine Gender-identity	b	↑	↑		↑	↓			↑
		Δ			↑					
	Religiosity	b			↑	↑	↑	↑		↑
		Δ	↑	↑	↑			↑		↑
Social Trends	Non-manual	b	↑		↑	↓		↑	↓	↓
		Δ	↑	↑	×		↑	↑		

Key

↑ prospective positive relationship in the expected direction

↑ contemporary positive relationship in the expected direction

↓ prospective negative relationship in the expected direction

↓ negative prospective relationship in the unexpected direction

negative contemporary relationship in the unexpected direction

↓* negative prospective relationship – no direction expected

negative contemporary relationship - no direction expected

× Evidence of relationship in both directions

8.4.1 Education

Table 8 1 shows that as expected education is usually associated with recommended health behaviour at the start of periods of health education. Table 8.1 also shows that education is usually associated with change towards recommended behaviour, and that broadly it has a similar effect for men and women However in regard to both initiation and change alcohol use is an exception. Both men and women with greater cognitive potential at age 8 were less likely to change towards recommended drinking, though there is some indication that more educated women did change in the recommended direction.

This analysis, by considering cognitive potential, own education and spouse's did allow for several different interpretations of education, respectively, as representing processing power, the educational process and an educated environment. In this analysis it is usually own education or spouse's education which are significant. This suggests that healthier behaviour is related to the educational process, and possibly some aspect of values that might go with education, such as the planning and organizational skills that may go with education, or some aspect of values. Generally, the results do not suggest that cognitive potential is responsible for healthier behaviour. However there are two cases where it is related to health behaviour. Firstly as related to women taking exercise at 36, when considering childhood factors only, and secondly associated with both men and women being less likely to heed the health education message on alcohol between 1982 and 1989. The first case is probably an artefact of the model building process, which treated school leaving age but not level of education as a childhood attribute. Once level of education was included in the model cognitive potential was not longer significant. The second case does not suggest that cognitive potential is associated with healthier behaviour. Instead it could be that cognitive potential is associated with greater capacity for alcohol, or that the cleverer people were quicker to spot the fundamental implausibility of the recommendation on alcohol and ignore it.

It is not easy to make direct comparisons between these results and other studies, because few adjust for income and social class. As previously discussed education is often found to be associated with 'healthy' behaviour. It is less often found to be associated with change (\$4.5.1, \$5.5.1, \$6.5.1, \$7.4.1) apart from in smoking habits. However these studies did not consider the educational level of spouse, i.e the effect of living in a more educated environment.

There are several possible explanations for why those in a more educated environment should be more likely to carry out recommended behaviour and to change faster. It could be the timing of when different groups find out about a particular health education issue. The more educated might find out about health education messages earlier before they become common currency and part of the 'official' recommendations. Then they have more time to assimilate and act on the message than the others. But there is very little evidence that knowledge alone is a sufficient condition for action (\$2) If this was the case one would expect the effect of education to 'wear' off over time as knowledge became evenly spread. Initially there might be an educational gradient, but as the message became common currency there should be less difference between educational groups. Because so few studies look at change in health behaviour by education and social class (which could confuse the issue) it is difficult to know if this is the case

It is possible that education is a marker for those attitudes and skills which health psychologists have shown relevant to health behaviour, such as locus of control, self-efficacy, or competence and resilience. Certainly some of these skills are needed to acquire education. Considering it the other way round, it is possible that education, in contrast to knowledge, gives you the capacity to change, perhaps because you will have already changed before. Education can give you the opportunity to break away from your family of origin (Wadsworth, Freeman, 1983)

It could be that education is a marker for social class and the relationship with education is merely a reflection of the relationship with social class. However these relationships shown are independent of social class and in some cases there is a relationship with education when there is not one by social class, for example in 1966 women at age 20 with more education were more likely to be never-smokers but there was no effect of parental social class or education.

Overall this analysis indicates that some aspect of the educational process or living in an educated environment is fairly consistently associated with healthier behaviour and change to healthier behaviour. In order to expand the protective role of education it would be useful to identify what aspects of education matters The most likely candidates are values or skills.

8.4.2 Social Circumstances

8.4.2.1 Material Circumstances

Table 8.1 shows that social circumstances do not have a straightforward relationship with initiation of or change to recommended health behaviour. Sometimes better material circumstances are associated with initiation of recommended behaviour - taking exercise - or of change to recommended behaviour - men giving up smoking, men and women changing to taking exercise and women eating more healthily. Sometimes better material circumstances are associated with not carrying out recommended behaviour - drinking at more than 'low-risk' levels or women not giving up smoking.

Given that education and social class were also included in the model building process, this is indicating that material circumstances are not independently and consistently contributing to unhealthy behaviour; being worse off by itself does not appear to lead to unhealthy behaviour. In many ways this is different from other studies that show poverty is linked with unhealthy behaviour. Part of the reason for the difference is that other studies do not also take into account education, current social class, social class of origin and other measures of social circumstances, which are likely to be correlated with income. The other possible reason is that this study did not identify those who had consistently been in poverty for many years, though it did consider measures looking back over the past year, such as finding it difficult to manage.

The general picture on material circumstances appears to be that lack of material resources is associated with foregoing things that potentially cost money, such as smoking for women, alcohol, eating more fibre and exercise It is true that with sufficient ingenuity it is possible to obtain cigarettes, leisure exercise, fibre and alcohol at very low cost, for example smuggling, jogging, bread and potatoes and homebrew. However

not having the same range of options as others may in itself be a deterrent, certainly cost is seen as a deterrent ($2.3.2.1). The exception to this pattern is lack of money seems to make it more difficult for men to give up smoking, but not necessarily women. The result on smoking for women is consistent with the long tradition of women putting their families' needs before their own, and current evidence that women, even working women, (which most women are (EOC, 1998)) still carry the burden of childcare and housework (EOC, 1998). It has been suggested that smoking is a protected activity that women give up last (Graham, 1987). Maybe women do still give up, or maybe smoking has a slightly different construction and meaning for this particular cohort of women considered here. Why there should be a difference between men and women, confirmed by a significant inter-action, is not clear. It could be that men because of their traditional role as breadwinners find it harder to cope with lack of money. It could be that for men's smoking is a cheaper way of coping than say getting a round of drinks at the pub. It could be that women have recourse to other coping mechanisms, such as a cup of tea, and maybe men do not.

8.4.2.2 Social Support

Social support is sometimes associated with recommended behaviour, i.e. with men less likely to smoke, both men and women more likely to take exercise. Sometimes social support is associated with not following recommended behaviour. Social support is associated with men drinking at more than 'low-risk' levels and women starting to smoke. This is consistent with the mixed results reviewed initially ($2.3.2.1). Almost always social support is associated with change in the recommended direction, except when there are specific barriers to change, such as the presence of children being a barrier to women eating a healthier diet.

Whether social support is associated with healthy behaviour or not appears to lie in the type of activity. Social support is associated with group activities, which may or may not lead to recommended behaviour. Social support is useful for taking exercise but unhelpful for drinking and possibly smoking. A caveat here is that these results could just be the result of how this aspect of social support has been measured, as attendance at clubs or membership of clubs of associations. However, these are the places where there is a good chance of building relationships, so it is hard to see that these particular measures of social support would not be similar to other measures of social support measured in terms of how people saw their relationships. On the other hand being part of a group helps promote change, which accords with lay reality where people use a plethora of self-help groups to change themselves. This is consistent with both the observation that there is no reason why social support should be associated with healthier behaviours (Wilkinson, 1999), and the observation that sometimes it is (Berkman et al, 2000). Further investigation of this distinction between the role of social support in maintenance and change would help clarify this point

8.4.2.3 Stress

Finally there is little evidence that how people feel about themselves measured by depression has any effect on whether they initiate or change to recommended behaviour. Depression may make it harder for men and women to give up smoking, but has mixed associations with diet, it appears to associated with both eating less fibre and eating a lower proportion of fat It is possible that a relationship is not being seen because some of the factors that might cause people to feel stressed, such as low-income, or living in rented property were also been considered. However unadjusted analysis showed that depression was not

related to drinking or smoking initiation, but was related to exercise and changing to take exercise and give up smoking. It is possible that the childhood measure of depression, which is a retrospective construct, is not a very good marker of childhood depression, although it has been used successfully before. Overall, this analysis gives at best some support to the idea that depression is associated with unhealthy behaviour, particularly smoking. A more focused measure of stress might have produced more convincing results More people suffer from stress than depression, so a small effect would have been easier to detect. The reasons for suffering from stress or depression may be different, and it is possible that the causes of stress may be more closely linked to health behaviour. If the aim of this research had been to investigate fully the relationship between mental state and health behaviour, it would have been better to construct a measure of stress, perhaps including adverse life events.

8.4.3 Image

Table 8.1 shows that individual behaviour is often in line with the public image, and associated with whether the individual has characteristics in line with the public image or not. Conformity in adolescence is associated with less smoking initiation in adolescence, and several aspects of healthier behaviour in adulthood: giving up smoking, men drinking within the 'low-risk' level and men changing towards drinking less than the 'low-risk' limit. Sociability in adolescence is associated with women's smoking initiation, women not giving-up smoking, drinking over the 'low-risk' limit, men changing to drink over the low-risk limit, taking exercise and women changing to take exercise. Sociability in adulthood is associated with women subsequently changing to more than 'low-risk' drinking and men not changing to following dietary recommendations. A more masculine gender-identity in adolescence is associated with smoking initiation, women drinking over the 'low-risk' limit and men taking exercise. A more masculine gender-identity in adulthood is associated with women drinking over the 'low-risk' limit, men changing to less drinking over the 'low-risk' limit and women eating a higher proportion of fat. Religiosity in adolescence is associated with men being less likely to drink over the 'low-risk' limit and more likely to take exercise. Religiosity in adulthood is associated with giving-up smoking, drinking within the 'low-risk' limit, women taking exercise, women changing to exercise and eating a healthier diet.

It is particularly noteworthy that aspects of image in adolescence are associated with behaviour 20 years later, allowing for education, material circumstances and social class, which does suggest image has a long-term effect. Generally, image has a similar effect for men and women. One might have expected women's behaviour to be more sensitive to the public image than men's, because of the historical position of women enjoying less freedom than men (§1.4.3), which women may have internalized. However, there is little evidence that this is the case.

Image appears to operate not just at the level of what people choose to do, but also how hard it is to change. It is easier to change towards something whose public image fits one's own image These findings are consistent with the relationship which has been observed between religiosity and smoking and alcohol use (§4.5.3.4, §5.5.3.4), and the relationships observed in more psychosocial studies between many personal qualities and health behaviours, such as between rebelliousness and smoking (§4.5.3 1), or between sociability and smoking or exercise (§4.5.3.2, §6.5.3.2). The difference in this study is that it provides a rationale for these linkages located in the social context.

It is arguable that these relationships between aspects of image and recommended behaviour are occurring merely because aspects of image are attributes of current social class or upward social mobility. However, these relationships exist independent of social class. Nor is it obvious how all aspects of image map onto current social class or if they did that they would be consistent with behaviour by social class For example, an aspect of image such as sociability is associated with both recommended behaviour – taking exercise – and not recommended behaviour – smoking and drinking. It is also arguable that aspects of image are simply predictors of upward social mobility, and that it is upward social mobility which is associated with healthy behaviour (Blane et al, 1993). As explained previously (§3.5 2), childhood or adolescent conformity, masculinity and religiosity, but not sociability are associated with achieved non-manual social class. Conformity and religiosity are both associated with healthier behaviour independent of social class, whilst masculinity and sociability are sometimes associated with unhealthier behaviour, and sometimes with healthier behaviour, depending on the public image of the health behaviour. Overall it is hard to see how upward social mobility could explain away the role of image, although it is possible that some aspects of image, such as conformity and religiosity, are associated with both healthier behaviour and upward social mobility.

A consideration here is that these relationships between aspects of image and health behaviours are not a direct relationship; they depend on the current public image of the behaviour. One does not always at all times and places expect masculinity, for example to be associated with smoking. It depends on the current public image, which is subject to change. The most obvious area where change is currently occurring is whether some activities are perceived as masculine or feminine. Smoking was for the NSHD an activity with a more masculine image. This is probably no longer the case in contemporary Britain, although it is still the case in parts of Asia (Yu et al, 2000), (Anzai et al, 2000). Alcohol use was for the NSHD an activity more indulged in by men, but it could change, as smoking has done. Change could also occur in whether some activities are perceived as rebellious or conformist, or social or not. Change is perhaps least likely along the religious dimension as religious associations with self-denial and self-control have held over millennia and are common to many cultures. One would expect the relationship between private and public image to hold across time and place, but one would not necessarily expect it to have the same effect The effect will depend on the public image.

8.4 4 Social Trends

Table 8.1 shows that individual behaviour is often in line with social trends mediated by social class. . Non-manual social class for men shows a prospective relationship with less smoking initiation, 'low-risk' drinking, changing to take exercise and eating a higher proportion of fat. Current non-manual social class for men is associated with quitting smoking Non-manual social class for women shows a prospective relationship with more drinking over the 'low-risk' limit, being more likely to take exercise, changing to take exercise and being more likely to eat a high-fat diet. These are particularly noteworthy as independent of material circumstances and education.

Considering men alone this could be construed as social class being directly related to following recommended behaviour, i e. non-manual social class is associated with healthier behaviour. For women

the relationship is less consistent, and there is evidence of long-standing social class trends for non-manual women to be more likely to drink, take exercise and eat a more varied and higher fat diet. Following social class trends is as plausible an explanation for women's health behaviour, as non-manual social class leading to following health education messages. It does not mean that social trends are necessarily relevant to all health behaviours. Social trends are going to be most pervasive for long-established habitual behaviour embedded in the fabric of people's lives, such as smoking. They might well be less pervasive for more infrequent health behaviours, such as attending for screening. Overall what this means is associations between habitual health behaviour and social class need to be interpreted in the light of social trends, especially when comparisons are made between different countries or different age groups, who will have been subject to a range of trends. Equally studies covering a limited range of countries in a limited time period may see a relationship which only describes the current situation, and miss the complexities of the relationship between health behaviours and social trends. For example smoking is currently associated with manual social class in the English-speaking world and Northern Europe, but not in some Southern Europe countries, such as Spain, where women's smoking is associated with non-manual social class (§4.5.4).

What is puzzling here is that women's behaviour is more in line with social class trends and men's behaviour with non-manual social class promoting healthier behaviour. It is arguable that women's behaviour is more constrained by notions of social acceptability, but this did not appear to be the case with image. It is possible that women are closer to and possibly more influenced by their families of origin (Young, Willmott, 1986). On the other hand, men's health behaviour has been a subject of concern for longer. Health messages may have been understood as being aimed more at men than women, because men have lower life expectancy, and suffer more coronary heart disease. However, it does not explain why non-manual men should have taken more action than manual men. One possible explanation is that there was at one time a perception that stressed executives were more at risk of heart disease, so maybe people who saw themselves as falling into this group, saw the message as more relevant to them, and following it as a reflection of their status. Women's behaviour is more consistent with older health promotion aimed at getting women to make changes for the sake of their families, e.g. cleanliness in the 1900s. It is not consistent with the general perception of women taking a greater interest in health, unless too that is for the sake of their families rather than themselves

8.5 Further Research

8.5.1 Analysis

This analysis used a stepwise model selection procedure and a large number of explanatory measures, because the best way of representing each underlying concept, particularly dimensions of image was not known. Carrying out the analysis it became obvious that only a subset were useful In retrospect it would possibly have been better to construct a small number of composite measures to represent each category, particularly each aspect of image It would have made the analysis conceptually clearer, easier to interpret and simpler. It would have been possible to test a hypothesis directly, rather than carrying out a more exploratory model selection procedure. Preliminary adjusted re-analysis with composite measures for image suggested it would have produced results giving more credence to image, so it was not felt

necessary to pursue it. However now that the image concepts have been shown to have some relevance it would be better in future to represent them by a few composite measures, and similarly for the other explanatory categories.

This analysis did not allow for missing data and it did not weight the sample to allow for the original stratification. There is no reason to think that this has led to substantial biases in the results. However multiple imputation has been shown in other studies of this data to improve the precision of the estimators (Longford et al, 2000), so it might have produced more precise results. Whether it is worth doing or not depends on the aim of the research, and the precision needed

8.5.2 Clarification

This discussion highlighted several areas where clarification would be beneficial. These are: the role of education, the meaning of tenure, differences between men and women, whether social support is associated with initiation or change, why is education different from social class and the role of stress.

Education is clearly important to health behaviour. The interpretation of education could be clarified by looking at it alongside parental functioning and measures of competence If these attenuate the effect of education, it would indicate they are the underlying reasons why education matters, and a potential point of intervention. The meaning of tenure could be considered by looking at the role of tenure in countries where renting is more socially acceptable, to see if it is relevant to health behaviour in those countries. If tenure did not matter in these countries it would be interesting to know if anything else strongly aspirational in that country's culture took its place. The role of social support could be clarified by seeing how it relates to initiation and change, rather than prevalence. The distinction between social class and education could be further explored and clarified. However, this distinction could be cohort specific, and might be different in cohorts where higher education is more or less common, or where educational qualifications are a pre-requisite for non-manual social class. The role of social class could be clarified by using different ways of representing social class; i.e. an occupational scale (Goldthorpe-Erikson) and a status related scale (Cambridge scale) and comparing the results. Finally is it possible that the role of stress and depression are related to prevalence rates; i e. as an unhealthy activity becomes less commonplace it is the case that those who continue to do it are those using it as a coping mechanism. If this is the case one would expect to see a stronger relationship with stress and depression in places with low prevalence rates than places with high prevalence rates. This argument would also suggest that in general the factors associated with health behaviour could vary with prevalence rates.

8.5.3 Image

The work on image is new and provides a way of filling the gap concerning agency and shows agency is relevant to behaviour. To my knowledge few have tried to explicitly link health behaviour to the social context, in a generic, measurable way using prospective data to test such a link. The underlying mechanisms proposed should hold across behaviours, time and culture. Here it has been tested on a range of health behaviours. However it has not been tested for different time or cultures. Such replication would be beneficial, but it must be done within the relevant social context, this requires identification in that

context of the public image for the relevant health behaviour, and then testing whether those who have an identity more in line with the public image are also more likely to carry out that health behaviour.

Social trends change quite slowly (§1.2). It is easiest to see the role of trends when looking at data covering 20 or 30 years. The data for the NSHD now becoming available for 1999 provides an opportunity to examine the role of trends in drinking, exercise and diet over a longer time period

8.6 Conclusion

On a theoretical level this research has opened up a new approach to understanding health behaviour, which can be operationalised. It has demonstrated how to delineate both the public image and the individual image. It has shown that alongside the 'traditional' explanations image does help explain why some people do or do not carry out some health behaviours. It has also provided an alternative view of what motivates change in social trends, i.e. that change is related to status seeking for all health behaviours. Ideally health behaviours should be attractive, glamorous and preferably patronized by the rich and famous.

At an individual level understanding why people are doing things provides potential for more focused and effective change strategies, just as advertisers see it as important to understand their market and spend significant sums on market research. However it is population level change which is required, and it is possible to make some suggestions here. Given that behaviour is enmeshed in an individual's image and status, it is not surprising that it is so hard to change behaviour, because it may involve changing identity, or foregoing status. Therefore, it would suggest that another way to achieve individual behavioural change is not to continue exhorting the individual, but to try and change the public image instead. Although individual change is required the role of image and social trends indicates that it might be better achieved by changing the climate of society, rather than giving individuals the responsibility to change regardless of social acceptability and their means to do so. A good example of this happening is smoking, where the banning of smoking from public places and worksites has made smoking less socially acceptable. Worksites and schools could be used to facilitate the provision of sports facilities and healthy food choices. In this context it is unfortunate that school playing fields have been sold off, the school meals service decimated and the willingness of teachers' to participate in extra-curriculum activities severely undermined during the disputes of the 1980s. Nevertheless, these are examples of what could be changed. It may well be that indirect routes concerned with improving all aspects of life, rather than those focusing on health are most effective in the long run, rather as changing the material conditions of society is necessary to promote better health for all.

APPENDIX A – MEASURES: SELECTION, DEFINITION AND VALIDATION

This section provides information on why and how the image measures were selected, definitions of the measures and some validation. Chapters 2 and 3 explain the theoretical basis for the categories (education, social circumstances, image and background), and the overall reason why measures were placed in one category or another

The same definitions are used throughout this thesis. This has the advantage of consistency and simplicity, and removes the risk of getting significant results because the definition has been tailored to fit a particular outcome. Measures are normally dichotomized into two categories, because some measures only have two categories, and using a stepwise selection procedure it is desirable to have all measures at approximately the same level of precision. However using consistent dichotomized measures has the disadvantage that it may occasionally miss the detail of some relationships, or it may miss relationships completely; for example, if the relationship is not linear and the dichotomisation is in the middle of the risk factor distribution. Many of the measures are in common use, particularly the ones used as measures of education, social circumstances and background. However the measures of image are new, so they are discussed in more detail first.

A.1 Image measure selection

This section discusses which measures were selected to represent each dimension of image and why. These are subjective judgements; they are not based on research findings. They are based on what seems reasonable and what by inspection of the data seems consistent, using the selection criteria described in §3.4.3.1.1.

A.1.1 Conformity

One aspect of conformity is respect for authority. Teachers rated the NSHD members on behaviour as regards authority (never difficult to discipline, never late without good reason, and never evading the truth to keep out of trouble) at ages 13 and 15. For each of these measures the smaller group contained at least 10% of the sample. The Cronbach's alpha for these three items is .59 at 15, and .52 at 13, so in the interests of simplicity and intelligibility, these have been collapsed into a composite measure. There is little difference between the sexes (0.59 for boys. 0.61 for girls). The composite measure to capture this aspect of conforming behaviour is defined as: conforms if the adolescent was never difficult to discipline, late without good reason or evaded the truth to keep out of trouble, and does not conform if the adolescent showed any one of these behaviours. Two such measures were constructed, one for behaviour at age 13 and one for age 15.

Application to schoolwork is another aspect of conforming to school. Teachers rated the NSHD members on attitude and application to schoolwork, (attitude to work at primary school, application at secondary school at ages 13 and 15). For each of these measures the smaller group contained at least 10% of the

sample, with the exception of application at 13 where the smaller group contained 9.3%. Nevertheless it was retained for consistency with the measure at 15.

It is arguable that these two groups of items (behaviour towards authority at ages 13 and 15) and application to school work (at ages 10, 13 and 15) do not represent the same concept, because the latter is much more focused on school achievement. So, they were not combined into a composite measure. Nevertheless, the Cronbach's alpha for all five items was acceptable at .60.

A number of other measures of conformity were considered and rejected because very few children fell into the smaller group, and when considered with the measures of conformity to the school ethos they reduced the Cronbach's alpha suggesting they are not measuring the same underlying concept. These were:

- Teacher rating child as difficult to discipline at primary school; 3% fell into this category
- Playing truant from school; 3% fell into this category
- Teacher rating child as a dare-devil; 7% fell into category

Some other measures were considered and rejected. These were shared interests with parents at 13 and seeing parents regularly at 36 or 43. They were considered because they could be construed as indicators of conformity. They were rejected because in childhood there more convincing measures of conformity available, and in adulthood contact with parents may reflect the amount of care the parents' need or proximity to parents, while lack of contact may indicate that the parents are already dead.

The disadvantage of these measures of conformity selected is that they cover adolescence only.

A.1.2 Sociability

Popularity and ease of making friends at 13 and 15 is an indication of the effect someone has on others. These are based on the teacher's assessments. For each of these measures the smaller group contained at least 10% of the sample. Cronbach's alpha for these three measures was .47. Cronbach's alpha for these three measures and going to clubs at 13 and 15 (from the social support section) was calculated in case these were in fact the same construct. It was lower (.44) which suggests popularity and friendliness compared to going to clubs are not representing the same concept. In the light of these results popularity and ease of making friends were retained but not combined into a composite scale.

The same sort of information about effect on others is not available in adulthood. The closest is information about seeing friends and relatives. These suffer from the fact that they were worded differently in 1982 and 1989 and do not correlate well together or with the childhood measures. The Cronbach's alpha for these five measures is .34.

A number of other potential measures of sociability were considered and rejected because very few children fell into the smaller group These were :

- Difficulties with siblings at age 9, 1% fell into this category
- Difficulties with other children at school at 9; 2% fell into this category

Some other potential measures of sociability were considered and rejected because they are not measuring the same concept. These were :

- Teacher's rating of happiness, which is an attribute of the child rather than an indication of their social interaction
- Nights out per week, which might be a measure of drinking opportunities rather than sociability
- Visits to the pub, which might be a measure of drinking opportunities rather than sociability

The disadvantage of these measures (popularity and friendliness as a child) and seeing friends and relations in adulthood, is that it is not clear that the childhood and adulthood measures are measuring the same concept. However superficially they all look like indicators of sociability and they are the best available.

A.1.3 Gender-identity

The concept of the socially constructed nature of gender had not been invented when data was being collected on the NSHD, despite its manifestations in their lives. Teachers rated the NSHD members at 13 and 15 on their aggression, competitiveness and roughness. For each of these measures the smaller group contained at least 10% of the sample. These measures had a Cronbach's alpha of .65 at 13 and 15, with little difference between girls and boys. Arguably they capture a concept of femininity and are reasonably homogeneous, so these items were used as a composite measure. The composite measure to capture femininity is defined as feminine if the adolescent was never aggressive, competitive or rough and masculine if the adolescent showed any one of these behaviours. Two such measures were constructed: one for behaviour at age 13 and one for age 15.

Some other potential measures were considered and rejected because their interpretation is not clear and because they did not appear to lie on the same dimension as other measures of femininity. These were

- having a father who helped care for them at age 4,
- earlier or later puberty
- attending a single-sex secondary school and having brothers in the family.

All these measures indicate something about the gender roles and the gender pressures the NSHD member might have experienced, but it is not obvious what effect they might have. For example does attending a single sex school re-enforce gender roles or give you the freedom to transcend them? Factor analysis of childhood measures confirmed that these measures did not lie on the same dimension as exhibiting feminine behaviour and probably did not have any bearing at all.

Another measure - avoiding attention as a more feminine attribute - was considered and rejected simply because it's interpretation was not clear. This measure correlates reasonably well with and is on the same dimension (by factor analysis) as the feminine behaviour measure, defined above However it is questionable whether avoiding attention is an attribute of femininity. Maybe it should have been included, and might have enhanced the role of gender.

The same sort of information about feminine behaviour is not available in adulthood. In adulthood a measure of gender-identity was constructed from occupation. In 1982 and 1989 the NSHD were classified into a hundreds of occupations, representing nature of work and level of skill or experience, using the 1980 and 1900 Classification of Occupations respectively (OPCS, 1980), (OPCS, 1990). Each of these occupations was categorized into male or female according the number of NSHD members of each sex in that occupation; an occupation with 50% or more men in it was classified as mainly male, an occupation with 49% or less men was classified as mainly female. Those without an occupation, mainly housewives and a few unemployed, were categorized as in a female occupation, because for women staying at home is taking on a more feminine role and for men going out to work is a traditional masculine role. Considering men and women separately for each of these measures the smaller group contained at least 10% of the sample, with the exception of women in a mainly male occupation in 1982, which was 9.8% of the sample. A possible disadvantage with a measure based on occupation is that it may discriminate differently between manual and non-manual jobs, because manual jobs are more strongly gendered. On the other hand that may also reflect reality. Cronbach's alpha for the measures of feminine behaviour at 13 and 15 and two adulthood measures of gender-identity is .55.

The disadvantage of these measures (feminine behaviour as an adolescent and male occupation as an adult) is that it is not clear that the childhood and adulthood measures are measuring the same concept. However, superficially they all look like indicators of gender-identity and they are the best available.

A.1.4 Religiosity

Possible measures of religiosity in childhood are going to Sunday school, (which 80% of the NSHD did) and whether at age 36 they felt they had had a religious upbringing. There is no reason why attendance at Sunday school reflects the child s interest, there is a long tradition of parents' enforcing attendance, so they could have some peace and quiet to get on with other pursuits. It is also possible that current circumstances and religious beliefs influence views on one's upbringing. In adulthood possible measures of religiosity are attending religious activities (at age 36 and 43) and having religious beliefs at age 36. For each of these measures the smaller group contained at least 10% of the sample.

Cronbach's alpha for the three adulthood measures is .67 for women and .63 for men. Cronbach's alpha for all these five measures came out at .64, which suggests they are measuring a similar concept. However, given that they are clearly not representing exactly the same concept, they were retained as separate items.

The Sunday school measure provides denomination. There are differences between faiths. Others have found differences in behaviour between denomination, for example in alcohol intakes (Knibbe et al, 1985). So if religiosity is related to behaviour it might be useful to examine differences between denominations.

A.2 Measure definitions

This section provides definitions of the explanatory measures used in this thesis. The measures have all been dichotomised, in the interests of having measures at roughly the same level of precision and ensuring that in practical terms it is possible to do the analysis. The dichotomisation aims to make meaningful distinctions, e.g. between the married and unmarried. Where there is no meaningful dividing point the NSHD have been divided approximately into halves. In many cases, the precise dichotomisation point is arbitrary. If measures have a robust relationship with the outcome, they will be insensitive to slight changes of definition.

A.2.1 Education

Table A. 1: Definition of Education measures

Measure of	Referred to as		Definition	At ages
Cognitive potential	Cognitive potential above av	Yes	Pictorial IQ above average	8
		No	Pictorial IQ below average	
Length of education	Left school at 16, or 16+	Yes	Left school at age 16 or older	16
		No	Left school at age 15	
Parental interest in school	Parents interested in primary school	Yes	Parents interest in primary school above average	11
		No	Parent s interest in primary school below average	
Educational level	Has O levels or more	Yes	Has O levels, A levels, degree or equivalent	n/a
		No	Has qualifications below O levels or equivalent	
Spouse's length education	Spouse left school at 16, or 16+	Yes	Has a spouse who left school at 16 or older	36
		No	Has a spouse who left school at 15 or no spouse	
Spouse's educational level	Spouse with qualifications	Yes	Has a spouse with any qualification at all	36, 43
		No	Has a spouse with no qualifications or no spouse	

Table A.1 shows the definitions of the measures used to represent education (and social cognitions) for the NSHD member and level of education in their environment. Most of these measures are in common use. Cognitive potential (measured by pictorial IQ at 8, the most value free of the tests given to the NSHD members) is considered as a possible underlying reason for the role of education, though it could be a marker for much more. For direct comparability with the other measures it was considered as a dichotomous variable above and below average, though the scores could have been used. Both educational qualifications and school leaving age are considered to provide a better understanding of education, because education was seen as less important for women in late 1950s Britain (§1.4.1). Parental interest in their child's progress at school is a measure of the value a NSHD member might have placed on education. Because girls' education might have been seen as less important, parental interest is only considered at the primary stage before girls and their parents might have begun to lose interest. Having a spouse with more education may 'rub-off', and indirectly influence the NSHD member's behaviour. It is also considered in terms of both school leaving age and highest qualification both for consistency and because these may represent different things for men and women.

A.2.2 Social Circumstances

Table A. 2: Definition of Social Circumstances measures

Measure of	Referred to as		Definition	Ages
		No	Parents renting	
	Owns own home	Yes	Is buying or owns home	36 43
		No	Renting	
	Low income or none (own)	Yes	Income below median for sex or none	36
		No	Income above median for sex	
	Income band higher	Yes	Net Household income above $15 000	43
		No	Net Household income below $15 000	
	Adequate Income	Yes	Manages fairly well or comfortably	
		No	Says Yes to it s really quite hard to manage	36 43
	Go without lack of money	Yes	Says Yes to 'had to go without necessities because short of money'	36 43
		No	Did not go without	
Social Support	Parental divorce	Yes	Parents divorced before NSHD member 26 years	
		No	Parents not divorced before NSHD member 26 years	
	Parents alive and well	No	At age 15 a parent dead or a parent s health not very good or poor	15
		Yes	Both parents alive and in average health or better	
	Interests with parents	Yes	Has a common interest w th mother or father	13
		No	No common interest with parents	
	Interests with peers	Yes	Has interests with other children	13
		No	Has no interests or only solitary interests	
	Goes to clubs	Yes	Goes to clubs – scouts, religious, youth, sports etc	13 15
		No	Does not go to any clubs	
	Married	Yes	Married	36, 43
		No	Single, divorced, widowed maybe living with a partner	
	Children at home	Yes	Children living in the home	36, 43
		No	No children living in the home	
	Member of clubs etc	Yes	Belongs to any clubs or associations	36
		No	Does not belong	
	Employed or housewife	Yes	In employment or calls self housewife	36, 43
		No	Not in employment and not housewife	
Stress	Childhood anxiety depression	Yes	Exhibits symptoms of anxiety disorder	15
		No		
	Depressive symptoms	Yes	Classed as depressed on PSE (1982) or PSF (1989)	36, 43
		No		

Table A.2 shows the measures used to represent Social Circumstances. There is no information on parental income, so tenure was used instead. The support from the NSHD members' family of origin is represented by interests with parents, parental marital status and parental health. Going to clubs and interests with peers represents support from friends. In the 1950s divorce was stigmatized and hard to obtain, so there may have been many families who stayed together unhappily for the sake of the children. What it means in practice is that divorce may be a weaker measure than it might be for later generations.

In adulthood, tenure, income and adequacy of income are all indicators of material well-being. Marital status, belonging to clubs, employment and children in the home are all potential indicators of social support. Mental health is included as an indicator of emotional well being. In the NSHD there are well-validated measures of depression. In childhood an anxiety-depression factor has been successfully constructed from the teacher's assessments (Jones et al, 1994), (van Os et al, 1997). Depression items include statements like 'persistently sad and gloomy', 'unable to make friends', 'tired and washed out', 'unduly miserable or worried'. As such it overlaps with some of the measures used on the image dimension. This potentially creates a problem for the analysis, which is overcome by running separate analyses for childhood anxiety and measures of image. In adulthood, depression is measured using a version of the Present State Examination (PSE) in 1982 and the Psychiatric Symptom Frequency scale

(PSF) in 1989 (Rodgers, Mann, 1986), (Rodgers, 1996). The reliability, validity and internal consistency of these measures for the NSHD have previously been established (Rodgers, Mann, 1986), (Rodgers, 1996), (Lindelow et al, 1997). It is possible that a measure more focused on the many forms of stress and strain would be more appropriate. However this thesis is not about mental health, so no attempt has been made to construct and validate such a measure.

A.2.3 Image

Table A. 3: Definition of Image measures

Measure of	Referred to as		Definition	At ages
Conformity	Conforms	Yes	Never difficult to discipline late without good reason or evades truth to keep out of trouble	13, 15
		No		
	Poor attitude to work	Yes	Poor or lazy attitude to work at school	10
		No	Average or hard working attitude at school	
	Works badly at school	Yes	A poor worker or lazy at school	13, 15
		No	Average or hard worker	
Sociability	Very popular	Yes	Very popular with other children	13
		No	Average popularity or tends to be ignored	
	Makes friends very easily	Yes	Makes friends extremely easily	13, 15
		No	Does not make friends extremely easily	
	Friends round weekly or more	Yes	Friends round to the house once a week or more often	36
		No	Has friends round less often than weekly	
	Frequent social contacts	Yes	Meets friends or relatives socially more than 15 times a month	43
		No	Meets friends or relatives socially than less 15 X a month	
Gender identity	Exhibits feminine behaviour	Yes	Is never aggressive competitive or rough	13, 15
		No	Aggressive competitive or rough	
	In male dominated occupation	Yes	Occupation has 50% or more men	
		No	Occupation 50% or less men or no occupation	
Religiosity	Religious upbringing	Yes	Reports a religious upbringing	36
		No	Does not report a religious upbringing	
	Goes to Sunday school	Yes	Attends a Sunday school of any denomination	11
		No	Does not got to Sunday school	
	Takes part in religious activities	Yes	Attends church or religious activities	36 43
		No	Does not	
	Has religious belief	Yes	Has religious beliefs	36
		No	Does not	

Table A.3 shows the definitions of the measures used for each dimension of image. All the childhood/adolescent measures of conformity, sociability and gender are based on the unvalidated assessments of a range of teachers in many different schools, at different times. The teachers were not trained in making these assessments, and there has been no standardization of assessments between teachers. This makes these measures rather crude, and probably less powerful than they might otherwise be. On the other hand it is arguable that assessments by a reasonably homogenous group of educated assessors, used to making judgments about adolescents who they had the opportunity to know quite well might be quite accurate. There is evidence that assessments by knowledgeable others can be more accurate than self-assessments (Kolar et al, 1996), (Kruger, Dunning, 1999) and that teachers are rather good at it (Bank et al, 1993).

A.2.4 Social Trends/ Background

Table A. 4: Definition of Background measures

Measure		Definition	At ages
Father non-manual	Yes	Father's occupation classified as non-manual	4,15
	No	Father's occupation classified as manual	
Father went to secondary school	Yes	Father went to secondary school or has further education	N/a
	No	Father only attended primary school	
Mother went to secondary school	Yes	Mother went to secondary school or has further education	N/a
	No	Mother only attended primary school	
Social class non-manual	Yes	Occupation of 'head of household' classfied as non manual	36, 43
	No	Occupation of 'head of household' classified as manual, or none	36, 43

Table A 4 gives the definition of the measures representing background. Social class at age 4 (in 1950) is used rather than social class at birth in 1946, because that was a time of change when many fathers would have just come out of the services and not had time to settle into permanent peacetime occupations. Parental education is included as well as social class to give a better idea of the environment in which the NSHD member grew up.

Social class was assigned using to the RG classification used in the 1980 census (OPCS, 1980). Head of the household is self for the unmarried and husband for the married, unless the husband has no occupation in which case it is the wife. This definition was used to minimize the number of cases where an NSHD member had a missing social class, as dropping those without a social class would have lost a potentially significant group. If the NSHD member still did not have a social class after this procedure, then they were assumed not to have a non-manual social class. It is possible that this occasional imputation of social class has strengthened the associations found. However some adjusted analysis with three social classes (non-manual, manual and unknown) revealed that those without a social class normally behaved in the same way as the manual group For married women their husband's social class has traditionally been used as a classification and may be a more useful measure, particularly for those at age 36 or 43 in 1982 and 1989 who were not working ($3 2).

A.3 Validation

Factor analysis is useful for establishing or checking dimensionality. However, factor analysis is sensitive to the structure of the data, and a slightly different selection of input variables can lead to different results. Factor analysis is also liable to create spurious dimensions out of highly correlated pairs, so it is best to use one of a correlated pair (Hair et al, 1998). There are different ways of extracting factors, which can produce different results So for this analysis different methods of extraction, and different selections of correlated pairs were tried to check that they gave reasonably similar results Hence reducing the possibility of subjectivity

A.3.1 Image dimensions

Factor analysis on all the childhood measures of image extracting four factors by principal components or principal axis factoring confirmed that all the childhood measures of image fell onto the dimensions

expected, with the exception of making friends easily at 15. Some of the adulthood image measures are highly correlated; these are the measures of religiosity and gender-identity, so only one adulthood measure for each of these was used. Factor analysis of all the other measures of image selected using either extraction by principal components or principal axis factoring did not produce completely consistent results. It confirmed that all the measures of conformity and religiosity, and the childhood measures of gender-identity and sociability (apart from making friends at 15) fell onto four distinct dimensions as expected. However the adulthood measures of gender-identity and sociability fell onto the expected dimensions with principal components extraction, but did not do so with principal axis factoring. Principal axis factoring is preferred for confirming the underlying structure of data (Hair et al, 1998), so this does not confirm that the adulthood measures of gender-identity and sociability lie on the expected dimension. However it is also not unequivocally the case that they do not.

A.3.2 Category validation

To see if the measures for the four categories hypothesized (Education, Social Circumstances, Image, Background) were representing distinct concepts, factor analysis was used with all measures from all four categories for adolescence and 1982. Principal axis factoring was used to extract eight factors (i.e. representing education, material circumstances, social support, 4 dimensions of image and background). Measures for the image dimensions generally tended to stay distinct from measures for the other categories, particularly the conformity, religiosity and sociability dimensions, though sometimes measures of the gender-identity dimension looked like the reveres of childhood social support. There was no evidence that indicators of social support were representing the same underlying concepts as measures of sociability. Other categories were less distinct from one another, although indicators of income and social support sometimes looked to be distinct from indicators of education, background. However factor analysis is not really a suitable tool here. It requires more detailed analysis taking into account the time dimension, possible pathways and potential interactions to unravel their relationships. As a final check that the image dimensions were reasonably distinct from the other categories a stepwise model selection procedure was used (§3.6.6) to establish if any childhood or adolescence aspect of image was related to achieved non-manual social class, firstly without childhood social class or measures of education (labeled model 1) and secondly with childhood social class and measures of education (model 2). The results are shown in Table A.5. These show that for both men and women conformity, masculinity and religiosity in early life are associated with achieved non-manual social class at 43, though their effect is greatly attenuated if childhood social class and own education are included. The rest of the thesis explores how these categories relate to health behaviour.

Table A. 5: Odds ratios and confidence intervals for childhood or adolescent measures of image significantly associated with achieved non-manual social class in 1989.

		Women		Men	
		Model 1	Model 2	Model 1	Model 2
Education					
Left school at 16, or 16+	Yes		2 2*** (1 62-3 12)		5 5*** (3 88-7 67)
	No		1		1
Has O levels or more			3 3*** (2 17-5 13)		2 7*** (1 93-3 87)
			1		1
Image					
Conformity					
Conforms at 13	Yes	1 7** (1 32-2 33)	1 4* (1 03-1 95)	1 9*** (1 46-2 55)	1.4* (1.02-1.99)
	No	1	1	1	1
Conforms at 15	Yes			1 7*** (1 27-2 21)	1
	No			1	1
Gender-Identity					
Exhibits femmine behaviour at 13	Yes			1	1
	No			1.4* (1 11-1 90)	1 2 (89-1.71)
Exhibits feminine behaviour at 15	Yes	1	1		
	No	1.4* (1 08-1.78)	1 2 (93-1.61)		
Religiosity					
Religious upbringing	Yes	15* (1.12-2 03)	1.2 (83-1.61)	1.7*** (1.32-2 29)	1 3* (92-1.78)
	No	1	1	1	1
Background					
Father non-manual at 4	Yes		1.5* (1.10-2 02)		1.7** (1.21-1 67)
	No		1		1
N		1178	1107	1188	1108
Chi squared		29 9	193 3	79.3	299 4
Df		3	6	4	8
Nagelkerke r square		.034	218	.087	.290

* P < .05, ** P < .005 , *** P < .0005

APPENDIX B: MISSING DATA

B.1 The data

The NSHD started off with all births (n=16,695) in England, Scotland and Wales between the 3rd and 9th March 1946. Information was collected on 13687 (82%) of these births and subsequently from the population of single, legitimate births all those in families with non-manual or agriculturally employed fathers were selected for follow-up together with 1 in 4 of the births to manual workers families, resulting in a stratified sample of 5362. Social class of the fathers of the study members in 1950 was not significantly different from that found in the census in 1951 (Wadsworth et al, 1992).
Despite this initial representativeness of the population there are a few limitations. Results are only generalisable to the British born population. Also they cannot be used to investigate the effect of birth at different times of year or of multiple or illegitimate births.

Inevitably some of the 5362 study members have died, emigrated, refused to take part or proved impossible to contact. Data has been collected at many times from many different sources: schools, doctors, health visitors, parents and the study members themselves with varying success rates. Table B.1 shows proportion contacted in the years used in this thesis. Generally data from years with lower contact rates has not been used and is not shown. The only exception is 1966, when data was collected via a postal questionnaire, as it is the first year to provide contemporary information on the study members' smoking habits.

Table B. 1: Data Collection Success Rates

Year	Died	Permanent refusal	Abroad	Not contacted	Contacted	% Contacted
1946	0	0	0	0	5362	100%
1950	229	1	232	200	4700	96%
1957	240	1	323	518	4281	89%
1959	247	1	320	667	4127	86%
1961	250	1	231	516	4274	89%
1966	268	7	372	816	3899	83%
1982	323	520	644	553	3322	86%
1989	365	540	607	370	3262	85%

B.2 The pattern of non-response

The NSHD has remained broadly representative (Wadsworth et al, 1992). However, it is not always the same people who do not respond, so using data from several different years together raises the possibility that those who responded in multiple years are not as representative as those who responded in any one year. Table B.2 shows the social class in 1946 of the father's of the NSHD members who did not respond in various years. The original proportions of non-manual and farming to manual (but not farming) are 56% to 44% in the total sample. Initially it is the child of non-manual parents who is more likely to get missed from any collection point. On the other hand, in adulthood it is more likely to be those from manual backgrounds who are missing. This is consistent with the previously noted attitudes to authority; i e. a culture of deference in the 1950s, possibly least subscribed to by the more privileged (§1.4.4). The data in childhood was collected from a wide variety of sources (schools, doctors, health visitors), so it is

quite possible that being missed in childhood does not relate to the personal characteristics of the NSHD member, though it might relate to the characteristics of their school, parents or such like. In adulthood, the data is collected directly from the study member, so not responding in adulthood is more likely to be related to the characteristics of the study member.

Table B. 2: Fathers' Social class for those missing from a data collection

	Data collected in					
Fathers' social class in 1946	1950	1957	1961	1966	1982	1989
Non-manual or farming	63%	62%	60%	56%	55%	54%
Manual (but not farming)	37%	38%	40%	44%	45%	46%

Overall, this suggests that there is probably not a consistent underlying process leading to losses, and that in particular subsets using complete childhood and adulthood records might have stayed representative of the original 1946 study. However it is still possible that the pattern of missing data depends on an explanatory variable.

Table B.3 shows whether study members who have data for all combinations of data points commonly used in this theses are different from the others on the basis of their father's social class. On the whole they are not. The potential problems appear to be that subsets with 1966 and 1982 outcomes and adolescent image measures have lost too many non-manual fathers, and subsets with diet diaries in 1982 and 1989 and other measures have lost too many manual fathers.

Table B. 3: Are those with complete data different from the rest?

	Outcome data available in these years for these topics							
All measures available in these groups for years up until 1982	1966	1982	Diet diary in 1982	1989	Diet diary in 1989	1966 and 1982	1982 and 1989	Diet diary in 1982 and 1989
Education	×	×	×	×	✓	×	×	✓
Social circumstances	✓	✓	×	×	×	×	×	✓
Image - Conformity	✓	✓	×	×	×	×	×	✓
Image – Sociability	✓	✓	×	×	×	×	×	✓
Image – Gender-identity	✓	✓	×	✓	×	✓	✓	×
Image - Religiosity	×	×	×	×	✓	×	×	✓
Background	×	×	×	×	×	×	×	×

× Those missing not significantly different from those with data available on father's social class in 1950 (P=. 05)

✓ Those missing are different from those with data available on father's social class in 1950

The main reason for the subset with childhood information and outcomes for 1966 or 1982 not matching the original sample is that too many with non-manual fathers are missing on the teacher's assessments used for some image and social circumstances measures On the basis of attitudes to deference in the 1950s, one would expect the teachers' assessments to be more likely to be missing for the children at independent schools, and that is in fact the case. Comparing children at independent schools with the others for whom data is available on the teachers' assessments, they are not significantly different (p=.05)

on measures of gender, most measures of conformity and some measures of sociability. They are less likely to have a poor attitude to schoolwork at 10. They are more likely to be rated as popular and good at making friends at 13. It is entirely plausible that independent schools instill social skills and self-presentation. As regards using these measures, the issue with attitude to work at 10 can be dealt with by avoiding that measure, as there are alternative measures of conformity. For the popularity and friendliness measures it means there are slightly fewer than there should be with high levels of sociability, so it may make it harder to detect the effect of these measures.

B.3 Unobserved Outcomes

The final possibility is that pattern of missing data depends on the outcome that would have been observed, for example heavy drinkers being more difficult to contact. As shown in Table B.4 outcomes for exercise and smoking are provided by almost all those contacted. There is no particular reason to think that not wanting to reveal smoking or exercise habits is a reason for avoiding the survey, when there are so many other questions which are asked and the NSHD members have a long history of contributing to a valuable study in confidence. On the other hand over 25% of the NSHD members who responded in 1982 or 1989 did not provide diet diaries. The diet diaries are the source for diet and alcohol outcomes used in this thesis.

Table B. 4: Percentage of those contacted who have outcome data in the years of interest

Outcome	1966	1982	1989
Smoking	99%	99%	99%
Drinking	n/a	73%	70%
Exercise	n/a	99%	99%
Diet	n/a	73%	70%

It is known that a substantial minority do not report their diets accurately (Price et al, 1997), it is equally possible that some sorts of diets are not reported at all. If this is the case one might expect to see differences in diet and alcohol intake between those who provided two diet diaries (in 1982 and 1989) and those who provided only one, and possibly different relationships with the explanatory variables. This possibility has been considered by checking if those who only provided one diet diary have different intakes or different relationships with the explanatory variables. This analysis is described in the appropriate results chapter because it is specific to each intake considered.

REFERENCES

Chapter 1

Aghion P, Williamson JG, 1998, Growth, Inequality and Globalization, CUP

Baggott R, 1990, Alcohol, Politics and Social Policy, Avebury

Barker DJP, Martyn CN, 1992, The maternal and fetal origins of cardiovascular disease. Journal of Epidemiology and Community Health, 46, pp8-11

Board of Trade, profiteering act, 1919, Findings by a committee appointed to enquire into the existence of a trade combination in the Tobacco Industry and into the effect which its operation had on prices and trade generally, Cmd 558, 1920

Board of Trade, 1921, Statistical Abstract for the United Kingdom, 70, HMSO

Board of Trade, 1931, Statistical Abstract for the British Empire, 60, HMSO

Bowlby EJM, 1952, Maternal Care and Mental Health A report prepared on behalf of the World Health Organization as a contribution to the United Nations programme for the welfare of homeless children. (2nd edition). Geneva, WHO

Boyd-Orr J. B., 1937, Food Health and Income, Macmillan

Browne G, 1950, Patterns of British Life, Hulton Press

Burn JL, 1960, Smoking A message from an MOH, The Chest and Heart Association.

Charlton J, Murphy M (eds), 1997, The health of adult Britain 1841-1994, Vol. 1, Decennial supplement No 12, the Stationery Office

Caruana S, Cowley J, Rutherford D, 1978, Teaching about alcohol and drinking, Tacade

Central Health Services Council, 1957, Report of the Central Health Services Council for the year ended December 31st 1956, HMSO

Central Office of Information, 1996, Women in Britain, HMSO

Central Statistical Office, 1991, Retail Prices 1914-1990, HMSO

Central Statistical Office, 1992, Economic Trends Annual Supplement, 1992 edition, HMSO

Cook C, Stevenson J, 1995, Britain since 1945, Longman

Davey-Smith G, Morris JN, 1992, Assessment of physical activity, and physical fitness, in population surveys, Journal of Epidemiology and Community Health, 46, pp89-91

Davison C, Smith GD, Frankel S, 1991, Lay epidemiology and the prevention paradox: the implications of coronary candidacy for health education Sociology of Health and Illness, 13(1):1-19

Department of Health, 1992, The health of the nation a strategy for health in England, HMSO

Department of Health, 1999, Reducing Health Inequalities An Action Report, Stationery Office

Department of Health and Social Security, 1976, Nutrition Education, HMSO

Department of Health and Social Security, 1978, Prevention and health, eating for health, HMSO

Department of Health and Social Security, 1981, Prevention and health, drinking Sensibly, HMSO

Department of Health and Social Security, 1984, Diet and cardiovascular disease. HMSO

Doll R, Hill B, 1950, Smoking and Carcinoma of the Lung BMJ, 1950. ii, pp739-748

Ebrahim S. Smith GD., 1997, Systematic review of randomised controlled trials of multiple risk factor interventions for preventing coronary heart disease. BMJ. ;314(7095):1666-74

Fentem P, Bassey EJ, Turnbull NB, 1988, The New Case for Exercise. Sports Council and Health Education Authority

Field F (ed.), 1983, The Wealth Report, Routldege Keegan Paul

Glass DV (ed.), 1954, Social Mobility in Britain, Routledge Keegan Paul

Godfrey C, Hardman G, Powell M., 1986, Data note--1. Alcohol, tobacco and taxation. Br J Addict. ;81(1):143-9.

Goldthorpe JH, 1980, Social Mobility and Class Structure in Modern Britain, Clarendon Press

Gorer G, 1955, Exploring English Character, Cresset Press

Gratton C, Taylor P, 1991, Government and the Economics of Sport, Longman

Halsey A H (ed.), 1988, British Social trends since 1900, Macmillan

Halsey A H, 1995, Change in British Society, OUP

Halsey A H, Webb J (eds.), 2000, Twentieth century British Social Trends, Macmillan

Health Education Council, 1970, Annual Report 69-70

Health Education Council, 1983, A discussion paper on proposals for nutritional guidelines for health education in Britain, NACNE

Heartbeat Wales, 1987, Exercise for Health, health related fitness in Wales

Hills J (ed.), 1996, New Inequalities the changing distribution of income and wealth in the UK, CUP

Layard R, Nickell S, Jackman R, 1994, The Employment Crisis, OUP

Linthwaite P, 1985, Great British Fun Run, Health Education Journal, 44,4,p219

Linthwaite P, 1987, Alcohol the National Context, Health Education Journal, 46(1):35-36

McGinnis JM, Foege WH, 1993, Actual causes of death in the United States, JAMA ;270(18):2207-12

McGuire C, 1988, Testing Concepts for the first National Drinkwise Day, Health Education Journal, 47,4, 148

McGuffin SJ, 1982, Smoking the knowledge and behaviour of young people in Northern Ireland, Health Education Journal, 41,2, pp53-9

McNeill AD, Jarvis MJ, Stapleton JA, Russell MAH, Eiser JR, Gammage P, Gray EM, 1988, Prospective study of factors predicting uptake of smoking in adolescents, Journal of Epidemiology and Community Health, 43, pp72-8

Macintyre S, 1997, The Black report and beyond, what are the issues? Soc. Sci. Med., 44, 6, pp723-741

Marmot MG, Brunner EJ, 1991, Alcohol and cardiovascular disease: the status of the U shaped curve, BMJ; 303, pp565-8

Marmot, M ,1981, Culture and Illness : Epidemiolgical Evidence in Foundations of Psychosomatics. Edited by MJ Christies and PG Mellett, John Wiley

Marwick A, 1982, British Society Since 1945, Penguin

Marshall G, Swift A, Roberts S, 1997, Against the Odds, Clarendon Press

Menotti A, Seccareccia F, 1985, Physical activity at work and job responsibility as risk factors for fatal coronary heart disease and other causes of death, Journal of Epidemiology and Community Health, 39, pp325-329

Ministry of Agriculture Fisheries and Food, 1991, Fifty years of the National Food Survey 1940-1990. HMSO

Ministry of Agriculture Fisheries and Food, 1999, National Food Survey 1998, Stationery Office

Ministry of Health, 1958, Report of the Ministry of health for the year 1957 part II, HMSO

Multiple Risk Factor Intervention Trial Research Group, 1990, Mortality Rates After 10.5 years for participants in the multiple risk factor intervention trial, JAMA, vol. 263, 13, pp1795-1801

Multiple Risk Factor Intervention Trial Research Group, 1982, Multiple Risk Factor Intervention Trial, JAMA, vol. 248, 12, pp1465-1477

National Coal Board, 1970, Health and Hygiene

Obelkevich J, Catterall P (eds.), 1994, Understanding Post-War British Society, Routledge

Ockene JK, Shaten BJ, 1991, Introduction, Overview, Method, and Conclusions, Preventive Medicine, 20, 552-563

Office for National Statistics, 1998a, Living in Britain, Results from the 1996 General Household Survey, Stationery Office

Office for National Statistics, 1998b, New earnings Survey, Stationery Office

Office for National Statistics, 1999, Family Spending, Stationery Office

Oliver MF, 1992, Doubts about preventing coronary heart disease, BMJ, 304, pp39-40

Prentice AM, Jebb SA., 1995, Obesity in Britain: gluttony or sloth? BMJ. ;311(7002):437-9.

Rees C, 1980, Analysis of a fun-run, Health Education Journal, 39,2, pp54-7

Rose G, Colwell L, 1992, Randomised controlled trail of anti-smoking advice: final (20 year) results, Journal of Epidemiology and Community Health, 46, pp 75-77

Rowbotham S, 1997, A Century of Women, Viking

Saunders P, 1995, Might Britain be a meritocracy?, Sociology, 29, 23-41

Saunders P, 1997, Social Mobility in Britain: An Empirical Examination of two competing Explanations, Sociology, 31, pp261-88

Savage M, Egerton M, 1997, Social Mobility, Individual Ability and the Inheritance of Class inequality, Sociology, 31, pp645-672

Smith HL (eds.), 1986, War and Social Change, Manchester University Press

Stephen AM, Sieber GM, 1994, Trends in individual fat consumption in the UK 1900-1985, British Journal of Nutrition, 71, 775-788

Swan AV, Melia RJW, Fitzsimons B, Breeze E, Murray M, 1989, Why do more girls than boys smoke cigarettes, Health Education Journal, 48,2, pp59-64

Todd GF, 1959, Statistics of Smoking, Tobacco Manufacturers' Standing Committee

Todd GF, 1966, Reliability of statements about smoking habits, Supplementary Report, Tobacco Research Council

Todd GF, 1975, Changes in smoking patterns in the UK, Tobacco Research Council

Tudor-Smith C, Nutbeam D, Moore L, Catford J., 1998, Effects of the Heartbeat Wales programme over five years on behavioural risks for cardiovascular disease: quasi-experimental comparison of results from Wales and a matched reference area. BMJ. ;316(7134):818-22.

Wilkinson RG, 1999, Putting the picture together: prosperity, redistribution, heath, and welfare, in Social Determinants of Health, eds. Marmot M, Wilkinson RG, OUP

Williams GP, Brake GT, 1980, Drink in Great Britain 1900 to 1979, Edsall

Chapter 2

Abel T, 1991, Measuring Health Lifestyles in a Comparative Analysis: Theoretical Issues and Empirical Findings, 32, 8, pp899-908

Ajzen I, 1985, From Intention to Actions : A Theory of Planned Behaviour, in Action-Control from Cognition to Behaviour, eds. Kuhl J, Beckmann J, Springer-Verlag

Ajzen I, 1991, The Theory of Planned Behaviour, Organizational Behaviour and Human Decision Processes, 50, pp179-211

Ajzen I, Fishbein M, 1980, Understanding Attitudes and Predicting Social Behaviour, Prentice Hall

Arber S, 1991, Class, paid employment and family roles: making sense of structural disadvantage, gender and health status, Soc. Sci. Med., 32,4, pp425-436

Archer MS, 1996, Culture and Agency, the place of culture in social theory, Cambridge University Press

Ashworth P, 1997, Breakthrough or bandwagon? Are interventions tailored to Stage of Change more effective than non-staged interventions? Health Education Journal 56, 166-174

Backett KC, Davison C, 1995, Lifecourse and Lifestyle: The Social and Cultural Location of Health Behaviours, Soc. Sci. Med. 40, 5, pp629-638

Bartley M, Blane D, Davey-Smith G, 1998, Introduction. beyond the Back report, Sociology of Health and Illness, 20, 5, pp563-577

Bartley M, Sacker A, Firth D, Fitzpatrick R , 1999, Understanding social variation in cardiovascular risk factors in women and men: the advantage of theoretically based measures Soc Sci Med.;49(6):831-45

Baun F, 1999, Social capital: is it good for your health? Issues for a public health agenda, J Epidemiol Community Health; 53; 195-6

Bell Q, 1976, On Human Finery, The Hogarth Press

Bentley M, 1999, Modern Histography: an introduction, Routledge

Berkman LF, Glass T, Brissette I, Seeman TE, 2000, From social integration to health: Durkheim in the new millennium, Soc. Sci. Med , 51, 843-857

Beunen G, Thomis M., 1999, Genetic determinants of sports participation and daily physical activity. Int J Obes Relat Metab Disord. ;23 Suppl 3:S55-63.

Blaxter M, 1990, Health and Lifestyles, Routledge

Blaxter M, Paterson E, 1982, Mothers and Daughters· a Three generational Study of health Attitudes and behaviour, Heinemann Educational Books

Borrell C, Dominguez-Berjon, Pasarin MI, Ferrando J, Rohlfs I, Nebot M, 2000, social inequalities in health related behaviours in Barcelona, J Epidemiol Community Health; 54 : 24-30

Bosma H, Peter R, Siegrist J, Marmot M, 1998, Two Alternative Job Stress Models and the Risk of Coronary Heart Disease, American Journal of Public Health, 88,1, pp68-74

Boudon R, 1986, Theories of Social Change, Polity Press

Bourdieu P, 1984, Distinction A Social Critique of the Judgement of Taste, Routledge

Boyd-Orr J. B., 1937, Food Health and Income, Macmillan

Brown GW, Harris TO, 1989, Life Events and Illness, Unwin Hyman

Bunton R, Murphy S, Bennett P, 1991, Theories of behavioural change and their use in health promotion: some neglected areas, Health Education Research : Theory and Practice, 6,2, 153-162

Burns T, 1992, Erving Goffman, Routledge

Buxton K, Wyse J, Mercer T, 1996, How applicable is the stages of change model to exercise behaviour? a review, Health Education Journal, 55, 239-257

Cade J, Booth S, 1990, What can people eat to meet the dietary goals: and how much does it cost, Journal of Human Nutrition and Dietetics,3,199-207

Calnan M, 1987, The health locus of control: an empirical test, Health Promotion, 2, 4 pp323-330

Caplan RD, Cobb S, French JRP, 1975, Relationships of Cessation of Smoking with Job Stress, Personality, and Social Support, Journal of Applied Psychology, 60,2,pp211-219

Caraher M, Dixon P, Lang T, Carr-Hill R, 1998, Access to healthy foods: part 1. Barriers to accessing healthy foods: differentials by social class, income and mode of transport, Health Education Journal; 57; pp191-201

Chandola T, 2000, Social class differences in mortality using the new UK National Statistics Socio-Economic
Classification, Soc. Sci. Med.; 50; 641-9

Charlton J, Murphy M (eds.), 1997, The health of adult Britain 1841-1994, Vol. 1, Decennial supplement No 12, the Stationary Office

Chassin L, Presson CC, Todd M, Rose JS, Sherman SJ, 1998, Maternal Socialization: The intergenerational Transmission of Parenting and Smoking, Dev Psychol.;34(6):1189-201.

Chinn DJ. White M, Harland J, Drinkwater C, Raybould S, 1999, Barriers to physical activity and socio-economic position: implications for health promotion. J Epidemiol Community Health, 53, 191-2

Cockerham C, Hattori H. Yamori Y, 2000, The social gradient in life expectancy: the contrary case of Okinawa in Japan, Soc. Sci Med., 51, 115-122

Cockerham WC, Abel T, Lueschen G. 1993, Max Weber, formal rationality, and health lifestyles, the Sociology Quarterly, 34, 3, pp413-425

Connerton P, 1989, How Societies remember, Cambridge University Press

Connor M, Armitage CJ, 1998, Extending the Theory of Planned behaviour: a review and avenues for Further Research, Journal of applied Social Psychology, 28, 15, pp1429-1464

Connor M, Norman P, 1995, Predicting Health Behaviours OUP

Cooper H, Arber S, Smaje C, 1998, Social class or deprivation? Structural factors and childrens' limiting long-standing illness in the 1990s, Sociology of Health and Illness, 20, 3, 289-311

Conway TL, Vickers RR, Ward, HW, Rahe RH, 1981, Occupational Stress and Variation in Cigarette, Coffee, ans Alcohol Concumption, Journal of Health and Ssocial behaviour, 22, pp155-165

Craik J, 1994, The face of fashion, Routledge

Crane D, 1994, The Sociology of Culture, Blackwell

Department of Health and Social Security, 1978, Prevention and health, eating for health, HMSO

Douglas M, 1996, Thought Styles, Sage

Douglas M, Ney S, 1998, Missing persons, A critique of personhood in the social sciences, University of California Press

Drever F, Whitehead M, Roden M, 1996, Current patterns and trends in male mortality by social class (based on occupation), Population trends, 86, pp15-20, Stationary Office

Duncan C, Jones K, Moon G, 1999, Smoking and deprivation: are there neighbourhood effects?, Soc. Sci. Med., 48, 497-505

Ellison CG, Levin JS., 1998, The religion-health connection. evidence, theory, and future directions. Health Educ Behav.;25(6):700-20.

Emirbayer M, Mische A, 1998, What is Agency?, American Journal of Sociology, 103, 4, pp962-1023

Engels F, 1969 [1892], The Conditions of the Working Class in England, Panther

Ennett ST, Flewelling RL, Lindrooth RC, Norton EC, 1997, School and Neighbourhood characteristics associated with school rates of alcohol, cigarette and Marijuana Use, Journal of health and Social Behaviour, 38, 55-71

Fazio RH, 1990, Multiple Processes by which attitudes guide behaviour : the mode model as an integrative framework, Advances in Experimental Psychology, 23, pp75-108

Fazio RH, Dunton BC, 1997, Categorization by Race: The impact of Automatic and Controlled Components of racial prejudice, Journal of Experimental Social psychology, 33, pp451-470

Ferrie JE, Shipley MJ, Marmot GM, Stansfield S, Davey-Smith G, 1998, The health effects of major organisational change and job insecurity, Soc. Sci. Med., 46,2, pp243-254

Finkelstein J, 1991, The Fashioned Self, Polity

Floyd DL, Prentice-Dunn S, Rogers RW, 2000, A meta-analysis of research on protection Motivation Theory, Journal of Applied Social Psychology, 30,2.pp407-429

Flugel JC, 1940, The psychology of clothes. Hogarth Press, 1940

Foxall GR, Goldsmith RG. Brown S, 1998, Consumer Psychology for Marketing. International Thomson Business Press

Friedman J, 1994, Consumption and Identity, Harwood Academic Publishers Gmbh

Giddens A, 1984. The Constitution of Society, Polity Press

Giddens A, 1987, Social Theory and Modern Sociology, Polity Press

Giddens A, 1991, Modernity and Self-Identity, Self and Society in the late modern age, Polity Press

Goldblatt P. Whitehead M, 2000 Inequalities in health – development and change, Population Trends, 100, pp14-19, Stationary Office

Goffman E, 1959 The Presentation of Self in Everyday Life, Penguin

Graham H, 1984, Women, Health and Family, Wheatsheaf

Graham H, 1989, Women and Smoking in the United Kingdom : the implications for health promotion, Health promotion, 3, 4, 371-382

Graham H, 1996, Smoking prevalence among women in the European Community 1950-90, Soc Sci Med, 43(2) 243-54.

Graham H, Blackburn C, 1998, The socio-economic patterning of health and smoking behaviour among mothers with young children on income support, Sociology of Health and Illness, 20, 2, 215-240

Graunt J, 1665, Reflections on the Weekly Bills of Mortality, Samuel Speed

Green G, Macintyre S, West P, Ecob R, 1991, Like parent like child? Associations between drinking and smoking behaviour of parents and their children, Br J Addict.;86(6):745-58

Gronow J, 1997, The Sociology of Taste, Routledge

Halberwachs M, 1992, On Collective Memory, The University of Chicago Press

Harris JR., 2000, Socialization, personality development, and the child's environments: comment on Vandell 2000 Dev Psychol.,36(6):711-23.

Hart C, Ecob R, Davey-Smith G. 1997. People, places and coronary heart disease risk factors: a multilevel analysis of the Scottish Heart Health Study Archive, Soc. Sci. Med., 56, 6, pp893-902

Hawe P, Shiell A, 2000, Social capital and health promotion: a review, Soc. Sci. Med., 51, 871-885

Hilton S, Doherty S, Kendrick T, Kerry S, Rink E, Steptoe A, 1999, promotion of healthy behaviour among adults at increased risk of coronary heart disease in general practice : methodology and baseline data from the Change of heart study. Health Education Journal, 58, 3-16

Hughes JA, Martin PJ, Sharrock WW, 1995, Understanding Classical Sociology, Sage

Iversen L, Klausen H, 1986, Alcohol consumption among laid-off workers before and after closure of a Danish shipyard: a 2 year follow-up study, Soc. Sci. Med., 22,1, pp107-9

Jarvis MJ, Wardle J, 1999, Social patterning of individual health behaviour: the case of cigarette smoking, in Social Determinants of health, eds. Marmot M, Wilkinson RG, OUP

Jonas K, 1993, Expectancy-value models of health behaviour: an analysis by conjoint measurement, European Journal of Social Psychology, 23 167-183

Judge K, Mulligan JA, Benzeval M, 1998, Income Inequality and Population health, Soc. Sci. Med., 46, 4-5, pp567-579

Karasek R, Theorell T, 1990, Healthy Work, Basic Books

Katz E, Levin ML, Hamilton H, 1963, Traditions of research on the diffusion of innovation, American Sociological Review.28, pp237-252

Kawachi I, Kennedy BP, Wilkinson RG, 1999, Crime: social disorganisation and relative deprivation, Soc. Sci. Med., 48, pp719-731

Kemm J, 1991, Health Education and the Problem of Knowledge, Health Promotion International, 6,4, pp291-6

Kennedy BP, Kawachi I, Prothrow-Stith D, Lochner K, Gupta V, 1998, Social capital, income inequality, and firearm violent crime, Soc. Sci. Med., 47, 1, pp7-17

Kendler KS, Thornton LM, Pedersen NL., 2000, Tobacco consumption in Swedish twins reared apart and reared together.Arch Gen Psychiatry. ;57(9):886-92.

Khlat M, Sermet C, Le Pape A, 2000, Women's health in relation to their family and work roles: France in the early 1990s; Soc. Sci. Med.; 50;pp1807-1825

Knowles D, 1962, The Evolution of Medieval Thought, Longman

Koopmans JR, Boomsma DI., 1996, Familial resemblances in alcohol use: genetic or cultural transmission? J Stud Alcohol. ;57(1):19-28

Kuhn T. S, 1970, The Structure of Scientific Revolutions, University of Chicago Press

Layder, 1994, Understanding Social Theory, Sage

Lennox AS, Bain N, Taylor RJ, McKie L, Donnan PT, Groves J, 1998, stages of change training for opportunistic smoking interventions by the primary health care team. Part 1: randomised control trial of the effect of training on patient smoking outcomes and health professional behaviour as recalled by patients, Health Education Journal, 47, 140-149

Levy, J (1991), A conceptual meta-paradigm for the study of health behaviour and health promotion, Health Education Research : Theory and Practice,6,2 195-202

Li HZ, Fish D, Zhou X, 1999, increase in cigarette smoking and decline of anti-smoking counselling among Chinese physicians: 1987-1996, Health Promotion International, 14, 2, pp123-131

Lindbladh E, Lyttkens CH, Hanson BS, Ostergren PO, 1997, The diffusion model and the social-hierarchical
process of change, Health Promotion International, 12,4, pp323-330

Lobmayer P, Wilkinson R, 2000, Income, inequality and mortality in 14 developed countries, Sociology of Health and Illness, 22, 4, pp401-414

Lupton D, 1994, Consumerism, commodity culture and health promotion, Health Promotion International, 9,2,pp111-118

Lynch JW, Kaplan GA, Salonen JT, 1997, Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stage of socio-economic life course, Soc. Sci. Med.; 44;6; pp808-819

McCraken G, 1990, Culture and Consumption, Indiana University Press

McDonough P, Williams DR, House JS, Duncan GJ, 1999, Gender and the Socio-economic Gradient in Mortality, Journal of Health and Social Behaviour, 40; pp17-31

McEwen BS, 1998, Protective and Damaging effects of stress Mediators, New England Journal of Medicine, 338, 3, pp171-179

McKendrick N, Brewer J, Plumb J. H, 1984, The Birth of a Consumer Society: The commercialization of Eighteenth Century England, Bloomington: Indiana University Press

Macintyre S, 1997, The Black report and beyond what are the issues? Soc. Sci. Med., 44, 6, pp723-745

Manstead ASR, van der Plight J, 1998, Should we expect more from Expectancy-Value Models of Attitude and Behaviour? Journal of Applied Social Psychology, 28, 15, pp1313-1316

Marmot M, Shipley MG, 1996, Do socio-economic differences in mortality persist after retirement? 25 year follow up of civil servants from the first Whitehall study, BMJ, 313; 1177-80

van de Mheen H, Stronks K, Bos van den J, Mackenbach JP, 1997, The contribution of childhood environment to the explanations of socio-economic inequalities in health in adult life: a retrospective study, Soc. Sci. Med., 44,1,pp13-24

Middleton D, Edwards D (eds.), 1990, Collective Remembering, Sage Publications Ltd

Millar MG, Millar KU, 1996, The effects of Direct and Indirect experience on affective and Cognitive responses and the Attitude-behaviour relation, Journal of Experimental Social Psychology, 32, 561-579

Milne S, Sherran P, Orbell S, 2000, Prediction and Intervention in health-related Behaviour: a meta-Analytic review of protection Motivation theory, Journal of Applied Social Psychology, 30, 1, pp106-143

Milner D, 1994, Contemporary Cultural theory, UCL Press

Montanari M, 1994, The Culture of Food, Blackwell

Murray M, Kiryluk S, Swan AV., 1985, Relation between parents' and children's smoking behaviour and attitudes. J Epidemiol Community Health. ;39(2):169-74

Mooney C, 1990, Cost and availability of healthy food choices in a London health district, Journal of Human Nutrition and Dietetics, 3, pp111-120

Nelson M, 1993, Social-class trends in British diet, 1860-1980 in Food, Diet and Economic Change Past and Present, ed. C Geissler, DJ Oddy, Leicester University Press

O'Connor EA, Friel S, Kelleher CC, 1997, Fashion consciousness as a social influence on lifestyle behaviour in young Irish adults, Health Promotional International, 12, 2, pp135-139

Ostberg V, 1997, The social patterning of child mortality: the importance of social class, gender, family structure, immigrant status and population density, Sociology of Health and Illness; 19, 4, pp415-35

Peter P, Alfredsson L, Hammar N, Siegrist J, Theorell T, Westerholm P, 1998, High effort, low reward, and cardiovascualr risk factors in employed Swedish men and women: baseline results from the WOLF Study, J Epidemiol
Community Health, 52, pp540-547

Pill R and Stott N, 1985, Choice or Chance: Further Evidence on Ideas of Illness and responsibility for health.
Soc. Sci. & Med., 20, 10, pp981-991

Popay J, 2000, Social capital: the role of narrative and historical research, J Epidemiol Community Health; 54; p401

Popay J, Williams G, Thomas C, Gatrell T, 1998, Theorising Inequalities in health: the place of lay knowledge, Sociology of Health and Illness, 20, 5, pp619-644

Pudule I, Grinberg D, Kadzianuskiene K, Abaravicius A, Vaask S, Robertson A, Mckee M, 1999, Patterns of smoking in the Baltic Republics, J Epidemiol Community Health; 53 pp277-282

Ragone G, 1996, International Sociology, Consumption Diffusion, 11(3), pp309-315

Rahkonen O, Laehelma E, Huuhka M, 1997, Past or present? Childhood living conditions and current socio-economic status as determinants of adult health, Soc. Sci. Med., 44, 3, pp327-336

Richard L, Potvin L, Mansi O, 1998, The ecological approach in health promotion programmes: the views of health promotion work in Canada, Health Education Journal, 57, pp160-173

Robert SA, 1998, Community Level Socio-economic status effects on adult health, Journal of Health and Social Behaviour, 39, pp18-37

Rogers EM, 1983, Diffusion of Innovations, Free Press

Rokeach M, 1968, Beliefs, Attitudes and Values, Jossey-Bass

Ross CE, 2000, Walking, exercise, and smoking: does neighbourhood matter? Soc. Sci Med., 51, pp265-274

Rossow I, Rise J., 1994, Concordance of parental and adolescent health behaviors., Soc Sci Med.;38(9):1299-305

Runciman G, 1998. The Social Animal, HarperCollins

Rutter DR, Quine L, Chesham DJ, 1993, Social Psychological Approaches to health, Harvester Wheatsheaf

Schwartz S, 1991, Women and depression: a Durkheimian Persepective, Soc. Sci. Med., 32,2 pp127-140

Sen AK. 1977, Rational Fools : A critique of the behavioural Foundations of Economic Theory, Philosophy and Public Affairs, 6, pp315-344

Sheiham A, Marmot M, Rawson D, Ruck N, 1987, food values : health and diet, in British Social Attitudes the 1987 report, eds. Jowell R, Witherspoon S, Brook L, Gower

Shkolnikov VM, Leon DA, Adamets S, Andreev E, Deev A, 1998, Educational level and adult mortality in Russia: an analysis of routine data 1979 to 1994, Soc. Sci Med., 47, 3, pp357-369

Siegrist J, Peter R, Junge A, Cremer P, Seidel D, 1990, Low status control, high effort at work and ischemic heart disease: prospective evidence from blue-collar men, Soc. Sci. Med., 31,10,pp1127-1134

Siegrist J, Siegrist K, Weber I, 1986, Sociological Concepts in the etiology of Chronic Disease: The case of iscgemic Heart Disease, Soc. Sci. Med., 22,2,pp247-253

Simmel G, 1957, Fashion, The American Journal of Sociology, LXII,6, pp541-558, reprinted from International Quarterly, X, 1904, pp130-55

Sorensen G, Stoddard A, Macrio E. 1998, Social Support and readiness to make Dietary Changes, Health Education and Behaviour, 25, 5, pp586-598

Sparks P, Guthrie CA, 1998, Self-identity and the theory of planned behaviour: a useful addition or an Unhelpful Artifice? Journal of Applied Social Psychology, 28, 15, pp1383-1410

Stacey M. 1987. The role of information in the development of social policy, Community Medicine, 9, 3, pp216-225

Steele V, 1988, Paris Fashion a cultural history, OUP

Storey J, 1993, An Introduction to Cultural Theory and Popular Culture, Prentice Hall/ Harvester Wheatsheaf

Stroebe W, Stroebe MS, 1995, Social Psychology and Health, Open University Press

Stronks K, van de Mheen H. Looman CWN, Mackenbach JP, 1998, The importance of psychosocial stressors for socio-economic inequalities in perceived health, Soc. Sci. Med., 46, 4-5, pp611-623

Sutton S. 1998a. How ordinary people in Greet Britain perceive the risks of smoking, J Epidemiol Community Health. 52, 338-339

Sutton S, 1998b. Predicting and Explaining Intentions and behaviour: how well are we doing? Journal of Applied Social Psychology. 28, 15, pp1317-1338

Swan GE., 1999, Implications of genetic epidemiology for the prevention of tobacco use. Nicotine Tob Res. (1SUPPL1):S49-56

Tagliacozzo R, Sci N, Vaughn S, 1982, Stress and Smoking in Hospital Nurses, American Journal of Public Health, 72,5, pp441-448

Thompson E P, 1978, The poverty of theory, & other essays. London. Merlin Press.

Thompson M, Ellis R, Wildavsky A, 1990, Cultural Theory, Westview Press

Vandell DL., 2000, Parents, peer groups, and other socializing influences. Dev Psychol.;36(6):699-710

Vartianen E, Pekkanen J, Koskinen S, Jousilahti P, Salomaa V, Puska P, 1998, do changes in cardiovascular risk factors explain the increasing socio-economic difference in mortality from ischaemic heart disease in Finland?, J
Epidemiol Community health: 52:pp416-419

Veblen, 1994, The theory of the Leisure class, Dover Thrift edition, originally, Macmillan

Veenstra G, 2000, Social capital, SES and health and individual level analysis, Soc. Sci. Med., 50, 619-629

Viken RJ, Kaprio J, Koskenvuo M, Rose RJ., 1999, Longitudinal analyses of the determinants of drinking and of drinking to intoxication in adolescent twins. Behav Genet. ;29(6):455-61.

Vilhjalmsson R, Thorlindsson T, 1998, Factors relating to physical activity: a study of adolescents, Soc Sci Med, 47(5):665-75

Wadsworth M, 1999, early life, in Social determinants of health eds. Marmot M, Wilkinson RG, OUP

Waldron I., 1991, Patterns and causes of gender differences in smoking. Soc Sci Med.,32(9):989-1005.

Wallston KA, 1991, The importance of placing measures of health locus of control beliefs in a theoretical context, Health Education Research theory and practise, 6, 2, pp251-2

Watson P, 1998, Health differences in Eastern Europe: Preliminary findings from the Nowa Hutta study, Soc. Sci. Med., 46, 4-5, pp 549-558

Weinstein ND, 1980, Unrealistic Optimism about Future Life Events, Journal of Personality and Social Psychology, 39, No 5, pp806-820

Weinstein ND, Lyon JE, 1999, Mindset, optimistic bias about personal risk and health protective behaviour, British Journal of Health Psychology, 4, pp289-300

Whitehead M, 1997, Editorial, How Useful is the 'Stage of change model'? Health Education Journal, 56, pp111-112

Whitehead M, Burstrom B, Diderichsen F, 2000, Social policies and the pathways to inequalities in health; Comparative analysis of lone mothers in Britain and Sweden, Soc. Sci. Med., 50, pp255-270

Wickrama KAS, Conger RD, Wallace LE, Elder GH, 1999, The intergenerational Transmission of health risk Behaviours: adolescent Lifestyle and gender Moderating Effects, Journal of Health and Social Behaviour, 40, 258-272

Wilkinson RG, Kawachi I, Kennedy BP, 1998, Mortality, the social environment, crime and violence, Sociology of Health and Illness, 20, 3, pp578-597

Wilkinson RG, 1999, Putting the picture together: prosperity, redistribution, heath, and welfare, in Social determinants of health, eds. Marmot M, Wilkinson RG, OUP

Chapter 3

Archer MS, 1996, Culture and Agency, the place of culture in social theory, Cambridge University Press

Bartley M, 1999, Measuring women's social position: the importance of theory, J Epidemiol Community Health: 53, 601-2

Bartley M, Sacker A, Firth D, Fitzpatrick R, 1999, Understanding social variation in cardiovascular risk factors in men and women: the advantages of theoretically based measures, Soc. Sci. Med., 49, pp831-845

Beckman LJ, 1978, Sex-Role Conflict in Alcoholic Women: Myth or Reality, Journal of Abnormal Psychology, 87, 4, 408-417

Bird CE, Rieker PP, 1999, Gender matters: an integrated model for understanding men's and women's health, Soc. Sci. Med. 48, 745-755

Blaxter M, 1990, Health and Lifestyles, Routledge

Bochner S, 1994, Cross-cultural differences in self-concept, Journal of Cross Cultural Psychology, 25, 2, pp273-283

Boulding KE, 1956, The Image, University of Michigan Press

Brewer RI, 1986, A note on the changing status of the Registrar General's classification of occupations. British Journal of Sociology, 27, 1, pp131-140

Cavelaars AE, Kunst AE, Geurts JJ, Crialesi R, Grotvedt L, Helmert U, Lahelma E, Lundberg O, Matheson J, Mielck A, Rasmussen NK, Regidor E, do Rosario-Giraldes M, Spuhler T, Mackenbach JP., 2000, Educational differences in smoking: international comparison, BMJ.;320(7242):1102-7

Caspi A, Harrington HL, Moffitt TE, Begg D, Dickson N, Langley J, Silva PA, 1997, Personality Differences Predict Health-Risk Behaviors in Young Adulthood: Evidence from a Longitudinal Study, Journal of Personality and Social Psychology, 73, 5, 1052-1063

Chandola T.2000, Social class differences in mortality using the new UK National Statistics Socio-Economic Classification, Soc. Sci. Med., 50, pp641-649

Chaney D, 1994, The cultural turn, Routledge

Chatfield C, 1970 Statistics for technology, Penguin

Cherry N, Kiernan K, 1976, Personality Scores and smoking Behaviour, Brit J Prev med, 30, pp123-131

Cooper H, Arber S, Smaje C, 1998, Social class or deprivation? Structural factors and children's limiting long-standing illness in the 1990s, Sociology of Health and Illness, 20,3, pp289-311

Courtenay WH, 2000, Constructions of masculinity and their influence on men's well-being: a theory of gender and health. Soc. Sci. Med., 50, pp1385-1401

Crane D, 1994, The Sociology of Culture, Blackwell

Cronbach LJ, 1951, Coefficient Alpha and the internal structure of tests, Psychometrika, 16,3,pp297-334

Dake K, 1991, Orienting Dispositions in the Perceptions of Risk, Journal of Cross-Cultural Psychology, 22, 1, pp61-82

Davey-Smith G, Hart C, Hole D, MacKinnon P, Gillis C, Watt G, Blane D, Hawthorne V, 1998, Education and occupational social class: which is the more important indicator of mortality risk? J Epidemiol Community Health; 52, pp153-160

Davison C, Frankel S, Davey-Smith G, 1992, The limits of Lifestyle: re-assessing 'fatalism' in the popular culture of illness prevention, Soc. Sci. Med. 34, 6, pp675-685

Dean K, 1989, Self care components of lifestyles: The importance of gender, attitudes and the social situation. Soc. Sci. Med., 29,2, pp137-152

Douglas JWD, 1964, The Home and the School, Macgibbon and Kee

Douglas M, 1986, How Institutions Think. Sage

Douglas M, 1996, Thought Styles, Sage

von Dras DD, Siegler IC, 1997, Stability in Extraversion and Aspects of Social Support at Midlife, Journal of Personality and Social Psychology, 72, 1, pp233-241

Ellison CG, Levin JS., 1998, The religion-health connection: evidence, theory, and future directions. Health Educ Behav.;25(6):700-20

Fernandez DR, Carlson DS, Stepina LP, Nicholson JD, 1997, Hofstede's Country Classification 25 years later, The Journal of Social Psychology, 137(1), pp43-54

Finn SE, 1986, Stability of Personality Self-Ratings Over 30 years; Evidence for an Age/Cohort Interaction, 50, 4, pp813-818

Francis LJ, Gibbs D, 1996, Prayer and Self-esteem among 8-to 11 year olds in the United Kingdom, The Journal of Social Psychology, 136(6), 791-793

Gelfand MJ, Triandis HC, Chan DK-S, 1996, Individualism versus Collectivism or versus authoritarianism, European Journal of Social Psychology, 26, pp397-410

Geyser S, Peter R, 2000, Income, occupational position, qualification and health inequalities – competing risks? (Comparing indicators of social status, J Epidemiol Community Health, 54, pp299-305

Gest SD, 1997, Behavioural Inhibition: Stability and Associations with Adaptation From Childhood to Early Adulthood, Journal of Personality and Social Psychology, 72, 2, pp467-475

Giddens A, 1991, Modernity and Self-Identity, Polity Press

Glass DV (ed.), 1954, Social Mobility in Britain, Routledge Keegan Paul

Graham H, 1996, Smoking prevalence among women in the European Community 1950-90, Soc. Sci. Med., 43, pp243-254

Greenberg RS, Kleinbaum DG, 1985, Mathematical Modeling Strategies for the Analysis of Epidemiologic Reseasrch, Annual Review of Public Health,6, pp223-45

Hair JF, Anderson RE, Tatham RL, Black WC, 1998, Multivariate Data Analysis, Prentice-Hall

Hamynen H, Vartiainen E, Sahi T, Pallonen U, Salonen JT, 1994, Social, Personality and Environmental Determinants of Smoking in Young Finnish Men, Scand J Soc. Med; 15; pp219-224

Hsieh FY, Bloch DA, Larsen MD., 1998, A simple method of sample size calculation for linear and logistic regression. Stat Med.;17(14):1623-34

Hofstede G, 1980, Culture's Consequences, Sage

Hosmer DW, Lemeshow S, 1989, Applied Logistic Regression, John Wiley and Sons

Krause N, Ingersoll-Dayton B, Liang J, Sugisawa H, 1999, Religion, Social Support, and Health among the Japanese Elderly, Journal of Health and Social Behaviour, 40, pp405-421

Leyens JP, Yzerbyt V, Schadron G, 1994, Stereotypes and Social Cognitions, Sage

Lipkus IM, Barefoot JC, Williams RB, Siegler IC, 1994, Personality Measures as Predictors of Smoking Initiation and Cessation in the UNC Alumni Heart Study, Health Psychology, 13, 2, pp149-155

Little RJA, Rubin DB, 1986, Statistical Analysis with Missing Data, John Wiley and Sons

Longford NT, Ely M, Hardy R, Wadsworth MEJ, 2000, Handling missing data in diaries of alcohol consumption, J. R. Statist. Soc. A, 163, part 3, pp381-402

McAdams DP, 1993, The stories we live by, Guilford Press

Macintyre S, Ellaway S, Der G, Ford G, Hunt K, 1998, Do housing tenure and car access predict health because they are simply markers of income or self-esteem? A Scottish Study, J Epidemiol Community Health, 52, pp657-664

May C, 1999, Perceptions of self, self-esteem, and the adolescent smoker, Health Education Journal, 58, pp211-217

Van Os J. Jones PB., 1999, Early risk factors and adult person--environment relationships in affective disorder. Psychol Med.;29(5):1055-67.

Parker FB, 1969, Self-role strain and drinking disposition at a prealcoholic age level, The Journal of Social Psychology, 78, pp55-61

Pollock K., 1988. On the nature of social stress: production of a modern mythology. Soc Sci Med. ,26(3):381-92.

Power C, Manor O, Fox J, 1991, Health and Class: The Early Years, Chapman and Hall

Prandy K. Class Stratification and inequalities in health: a comparison of the registrar generals Social Classes and the Cambridge scale, Sociology of health and Illness, 21,4, pp466-484

Realo A. Allik J, 1999, A Cross-Cultural Study of Collectivism : A comparison of American, Estonian and Russian Students, The Journal of Social Psychology, 139(2), pp133-142

Ricciardelli LA, Williams RJ, Kiernan MJ, 1998, Relation of Drinking and Eating to Masculinity and Femininity, Journal of Social Psychology, 138(6), pp744-752

Robinson JP, Shaver PR, Wrightsman LS, 1991, Criteria for scale selection and evaluation in Measures of Personality and Social Psychological Attitudes, JP Robinson, PR Shaver and LS Wrightsman (eds), Academic Press

Schwartz SH. 1990, Individualism-Collectivism. Critique and proposed refinements, Journal of Cross Cultural Psychology, 21, 2, pp139-157

Shakespeare W, 1951, As you like it, in The Alexander Text of the Complete Works of Shakespeare, Collins

Shiner RL. 2000. Linking Childhood Personality With Adaptation: Evidence for Continuity and Change Across Time Into Late Adolescence, Journal of Personality and Social Psychology, 78, 2, 310-325

Stansfield S A, 1999, Social Support and Social Cohesion, in Social determinants of health eds. Marmot M. Wilkinson RG OUP

Swingewood A, 1998, Cultural theory and the problem of modernity, Macmillan Press

Tabachnick BG, Fidell LS, 1983, Using Multivariate Statistics, Harper & Row

Thompson M, Ellis R, Wildasvsky A, 1990, Cultural Theory, Westview Press

Triandis HC, McCusker C, Betancourt H, Iwao S, Leung K, Salazar JM, Setiadi JBP, Touzard H, Zaleski Z. 1993, An etic-emic Analysis of Individualism and collectivism, Journal of Cross Cultural Psychology, 24, 3, pp366-383

Whiteman MC, Fowkes FGR, Geary IJ, Lee AJ, 1997, Hostility, cigarette smoking and alcohol consumption in the general population, Soc. Sci. Med., 44, .8, pp1089-1096

Wadsworth MEJ, 1991. The Imprint of Time, Oxford University Press

Wadsworth MEJ. Mann SL. Rodgers B, Kuh DJL, Hilder WS, Yusuf EJ, 1992, Loss and representativeness in a 43 year follow-up of a national birth cohort, J Epidemiol Community Health; 42, pp300-304

Chapter 4

Addison P, 1995, Now the war is over. a social history of Britain 1945-51, London, Pimlico

Amos A. Gray D, Currie C, Elton R., 1997, Healthy or druggy? Self-image, ideal image and smoking behaviour among young people. Soc Sci Med.;45(6):847-58.

Anda RF, Croft JB, Felitti VJ, Nordenberg D, Giles WH, Williamson DF, Giovino GA., 1999, Adverse childhood experiences and smoking during adolescence and adulthood. JAMA.; 282(17):1652-8

Bartley M, Sacker A, Firth D, Fitzpatrick R., 1999, Understanding social variation in cardiovascular risk factors in women and men: the advantage of theoretically based measures. Soc Sci Med. ;49(6):831-45

Bennett S, 1995, Cardiovascular risk measures in Australia: trends in socioeconomic inequalities, Journal of Epidemiology and Community Health; 49: 363-372.

Bewley BR, Day I, Ide L, 1973, Smoking by Children in Great Britian – a Review of the Literature, SSRC/MRC. London

Bland JM, Bewley BR, Day I., 1975, Primary schoolboys: image of self and smoker. Br J Prev Soc Med.;29(4):262-6.

Blane D, Hart CL, Smith GD, Gillis CR, Hole DJ, Hawthorne VM., 1996, Association of cardiovascular disease risk factors with socioeconomic position during childhood and during adulthood., BMJ. ;313(7070):1434-8.

Blythe A, 1948, Your smoke gets in his eyes, Woman, Sept25, p7

Bobak M, Hertzman C, Skodova Z, Marmot M., 1999, Socioeconomic status and cardiovascular risk factors in the Czech Republic. Int J Epidemiol. ;28(1):46-52

Bjornson W, Rand C, Connett JE, Lindgren P, Nides M, Pope F, Buist AS, Hoppe-Ryan C, O'Hara P., 1995, Gender differences in smoking cessation after 3 years in the Lung Health Study. Am J Public Health. ;85(2):223-30.

Borras JM, Fernandez E, Schiaffino A, Borrell C, La Vecchia C, 2000, Pattern of Smoking Initiation in Catalonia, Spain. From 1948-1992, American Journal of Public Health, 90, 9, pp1459-1462

Borrell C, Dominguez-Berjon, Pasarin MI, Ferrando J, Rohlfs I, Nebot M, 2000, social inequalities in health related behaviours in Barcelona, J Epidemiol Community Health: 54 : 24-30

Brannstrom I, Weinehall L, Persson LA, Wester PO, Wall S., 1993, Changing social patterns of risk factors for cardiovascular disease in a Swedish community intervention programme. Int J Epidemiol.:22(6):1026-37

Brenner H, Mielck A. 1993, The role of childbirth in smoking cessation. Prev Med. 22(2):225-36

Breslau N, Peterson EL, Schultz LR. Chilcoat HD, Andreski P, 1998, Major Depression and Stages of Smoking, Arch Gen Psychiatry,55,pp161-66

Browne. G., 1950. Patterns of British Life, Hulton Press

Bynner J. M. , 1969, The Young Smoker, HMSO

Calder A. 1969, The People's War: Britain 1939-45. London: Jonathan Cape

Carr-Saunders A. M., Caradog Jones D, Moser C. A., 1958, A survey of Social Conditions in England and Wales, Oxford

Cartwright A, Martin FM, Thomson JG, 1959, Distribution and development of smoking habits. The Lancet, 31 Oct 1959, pp725-727

Cartwright A. Martin F. M., Thomson J. G. , 1960, 'Health hazards of cigarette smoking current and popular beliefs'. Britritish Journal of Preventive and social medicine,14,160-66

Cavelaars AE, Kunst AE, Geurts JJ, Crialesi R, Grotvedt L, Helmert U, Lahelma E, Lundberg O, Matheson J, Mielck A, Rasmussen NK, Regidor E, do Rosario-Giraldes M, Spuhler T, Mackenbach JP., 2000, Educational differences in smoking: international comparison. BMJ. Apr 22;320(7242):1102-7

Chassin L, Presson CC, Todd M, Rose JS, Sherman SJ, 1998, Maternal Socialization: The intergenerational Transmission of Parenting and Smoking, Developmental Psychology, vol 34, no 6, pp1189-1201

Cherry N, Kiernan K, 1976, Personality Scores and smoking Behaviour, Brit J Prev med, 30, pp123-131

Choi WS. Pierce JP, Gilpin EA, Farkas AJ, Berry CC, 1997, Which Adolescent Experimenters Progress to Established Smoking in the United States, American Journal of Preventive Medicine, 13,5, pp385-391

Clayton S., 1991, Gender differences in psychosocial determinants of adolescent smoking. J Sch Health.;61(3):115-20

Cmd.7834. 1949, Forticth Report of the Commissioners of His Majesty's Customs and Excise for the Year ended 31st March 1949, London, HMSO

Conrad KM, Flay BR, Hill D, 1992, Why children start smoking cigarettes: predictors of onset, British Journal of Addiction, 87, pp1711-1724

Cooper WH. Kohn PM.,1989. The social image of the young female smoker. Br J Addict.;84(8):935-41.

Derzon JH. Lipsey MW, 1999. Predicting tobacco use to age 18: a synthesis of longitundinal research. Addiction. 94(7), pp995-1006

Doll R., Hill A. B.,1954, The mortality of doctors in relation to their smoking habits : a preliminary report, British Medical Journal, 4887, 1451-55

Ebrahim SH, Floyd RL, Merritt RK, Decoufle P, Holtzman D.. 2000, Trends in pregnancy-related smoking rates in the United States, 1987-1996.JAMA.:283(3):361-6

Emmons KM, Wechsler H. Dowdall G, Abraham M., 1998, Predictors of smoking among US college students. Am J Public Health :88(1):104-7.

Epstein JA, Griffin KW, Botvin GJ., 2000, Competence skills help deter smoking among inner city adolescents. Tob Control. 2000 Mar;9(1):33-9

Escobedo LG. Reddy M, Giovino GA, 1998, The relationship between depressive symptoms and cigarette smoking in US adolescents. Addiction, 93,3. pp433-440

Fazio R. H., 1990, Multiple Processes by which attitudes guide behaviour: the mode model as an integrative framework, Advances in Experimental Social Psychology, 23, 75-109

Flint A. J., Novotny T. E., 1997, Poverty status and cigarette smoking prevalence and cessation in the United States. 1983-1993: the independent risk of being poor, Tobacco Control 1997;6,14-18

Goodman J.,1993, Tobacco in History, Routledge

Graham H., 1987, Women's smoking and family health. Soc Sci Med. ;25(1).47-56

Graham H. 1996, Smoking prevalence among women in the European Community 1950-90, Soc. Sci. Med., 43. pp243-254

Graham H. Blackburn C, 1998. The socio-economic patterning of health and smoking behaviour among mothers with young children on income support, Sociology of health and Illness, vol 20, no 2, pp215-240

Graham H, Der G, 1999, Patterns and predictors of smoking cessation among British women, Health Promotion International, 14,3.pp231-239

Great Britain Registrar General's Office, 1938, Decennial supplement. England and Wales, 1931.London, HMSO

Great Britain Registrar General, 1957, The registrar general's decennial supplement, England and Wales, 1951, London. HMSO

Great Britain Registrar General, 1969, The registrar general's decennial supplement, England and Wales, 1961, London, HMSO

Halsey A H (ed), 1988, British Social trends since 1900, Macmillan

Halsey A H. Webb J (eds), 2000, Twentieth century British Social Trends, Macmillan

Hamynen H, Vartiainen E, Sahi T, Pallonen U, Salonen JT., 1987, Social, personality and environmental determinants of smoking in young Finnish men. Scand J Soc Med.;15(4):219-24

Hardy A, 2001, Health and Medicine in Britain Since 1860, Palgrave

Hatziandreu EJ, Pierce JP, Lefkopoulou M, Fiore MC. Mills SL, Novotny TE, Giovino GA, Davis RM., 1990, Quitting smoking in the United States in 1986. J Natl Cancer Inst. ;82(17):1402-6

Hobson J. W., Henry H., 1948, The Pattern of Smoking Habits, Hulton Press

House JS, Strecher V, Metzner HL, Robbins CA, 1986, Occupational Stress and health among men and women in the Tecumsh Community Health Study. J Health Soc Behav, 27, pp62-77

Hu T, Zihua L, Keeler TE, 1998, Teenage Smoking, Attempts to Quit, and School Performance, American Journal of Public Health. 88, 6. pp940-943

Isohanni M, Moilanen I, Rantakallio P, 1991, Determinants of teenage smoking, with special reference to non-standard family background, British Journal of Addiction, 86, pp391-398

Jarvis MJ., 1996, The association between having children, family size and smoking cessation in adults. Addiction.;91(3):427-34.

Jarvis MJ. Wardle J, 1999, Social patterning of individual health behaviours: the case of cigarette smoking, in Social Determinants of Health, eds Marmot M, Wilkinson RG, OUP

Jorm AF, Rodgers B, Jacomb PA, Christensen H, Henderson S, Korten AE., 1999, Smoking and mental health: results from a community survey, Med J Aust.;170(2):74-7.

Karvonen S, Rimpela A, 1996, Socio-regional Context as a determinant of adolescents health behaviour in Finland, Soc. Sci. Med., vol 43, no 10, pp1467-1474

Koenig HG. George LK, Cohen HJ, Hays JC, Larson DB, Blazer DG., 1998, The relationship between religious activities and cigarette smoking in older adults. J Gerontol A Biol Sci Med Sci.;53(6):M426-34

Krohn MD, Massey JL, Skinner WF, Lauer RM., 1983, Social bonding theory and adolescent cigarette smoking: a longitudinal analysis. J Health Soc Behav. ;24(4):337-49

Lasser K, Boyd JW, Woolhandler S, Himmelstein DU, McCormick D, Bor DH., 2000, Smoking and mental illness A population-based prevalence study JAMA. ;284(20) 2606-10.

La Vecchia C, Decarli A, Pagano R, 1995, Patterns of smoking initiation in Italian males and females from 1955 to 1985, Prev med, 24, pp293-296

Lawton MP, 1962, Pyschological Aspects of Cigarette Smoking, Journal of Health and Human Behaviour, III, no 1, pp163-170

Leino-Arjas P, Liira J. Mutanen P, Malmivaara A, Matikainen E., 1999, Predictors and consequences of unemployment among construction workers: prospective cohort study. BMJ ;319(7210):600-5.

Lifrak PD, McKay JR, Rostain A, Alterman AI, O'Brien CP., 1997, Relationship of perceived competencies, perceived social support and gender to substance use in young adolescents J Am Acad Child Adolesc Psychiatry. ;36(7):933-40.

Longmate N, 1971, How We Lived Then: A History of Everyday Life during the Second World War. London: Hutchinson

Lundberg O, Rosen B, Rosen M., 1991, Who stopped smoking? Results from a panel survey of living conditions in Sweden. Soc Sci Med.;32(5):619-22.

Lindstrom M, Hanson BS, Ostergren PO, Berglund G., 2000, Socioeconomic differences in smoking cessation: the role of social participation. Scand J Public Health.;28(3):200-8.

Lipkus IM, Barefoot JC, Williams RB, Siegler IC., 1994, Personality measures as predictors of smoking initiation and cessation in the UNC Alumni Heart Study , Health Psychol. ;13(2):149-55

McGee R, Williams S, Stanton W, 1998, is mental health in childhood a major predictor of smoking in adolescence? Addiction. 93,12, pp1869-1874

Mcleod H, 1996, Religion and Society in England, 1850-1914, Croom-Helm

McGinnis JM, Foege WH. 1993. Actual causes of death in the United States, JAMA :270(18):2207-12

Mace C. A. ,1949, Status and Morale, Nineteenth Century and After,146,169-173

Marang-van de Mheen PJ, Smith GD, Hart CL., 1999, The health impact of smoking in manual and non-manual social class men and women: a test of the Blaxter hypothesis. Soc Sci Med.;48(12):1851-6

Marmot, M ,1981, Culture and Illness : Epidemiolgical Evidence in Foundations of Psychosomatics. Edited by MJ Christies and PG Mellett, John Wiley

Michell L, Amos A, 1997, Girls, Pecking order and smoking, Soc. Sci. Med., vol 44, no 12, pp1861-1869

Miller H, 1971, Service to the Services: The Story of Naafi. London: Newman Neame,

Ministry of Health. 1958. Report of the Ministry of health for the year 1957 part II, HMSO

Nordstrom BL, Kinnunen T, Utman CH, Krall EA, Vokonas PS, Garvey AJ., 2000, Predictors of continued smoking over 25 years of follow-up in the normative aging study. Am J Public Health. ;90(3):404-6.

Oakley A, Brannen J, Dodd K, 1992, Young people, gender and smoking in the United Kingdom, Health Promotion International, 7(2):vol 7, no 2, pp75-88

ONS, 2000, Living in Britain, results from the 1998 General Household Survey, London, The Stationary Office

Osler M., 1995, Unemployment and change in smoking behaviour among Danish adults, Tobacco Control; 4, 53-56

Owen L, McNeill A, Callum C , 1998, Trends in smoking during pregnancy in England, 1992-7: quota sampling surveys. BMJ.;317(7160):728

Osler M, Gerdes LU, Davidsen M, Bronnum-Hansen H, Madsen M, Jorgensen T, Schroll M., 2000, Socioeconomic status and trends in risk factors for cardiovascular diseases in the Danish MONICA population, 1982-1992 J Epidemiol Community Health.;54(2):108-13.

Parry O, Platt S, Thomson C, 2000. Out of sight, out of mind: workplace smoking bans and the relocation of smoking at work. Health Promotion International, 15(2): 125-133

Patton GC, Carlin JB, Coffey C, Wolfe R, Hibbert M, Bowes G, 1998, Depression, Anxiety, and Smoking Initiation. A Prospective Study Over 3 Years, American Journal of Public Health, 88, pp1518-1522

Pekkanen J, Uutela A, Valkonoen, Vartiainen, Tuomilehto J, Puska P ,1995, Coronary risk measures levels· Differences between educational groups in 1972-87 in eastern Finland, Journal of Epidemiology and Community Health; 49: 144-149.

Pollock AM, Vickers N., 1997, Breast, lung and colorectal cancer incidence and survival in South Thames Region, 1987-1992: the effect of social deprivation. J Public Health Med. ;19(3):288-94.

Poulton P, 1973, Cigarette smoking among Grammer School girls, Health Education Journal, 32,4,pp114-119

Pudule I, Grinberga D, Kadziauskiene K, Abaravicius A, Vaask S, Robertson A, McKee M., 1999, Patterns of smoking in the Baltic Republics. J Epidemiol Community Health ;53(5):277-82.

Rice VH, Templin T, Fox DH, Jarosz P, Mullin M, Seiggreen M, Lepczyk M., 1996, Social context variables as predictors of smoking cessation. Tob Control.;5(4) 280-5.

Romano PS, Bloom J, Syme SL., 1991, Smoking, social support, and hassles in an urban African-American community.Am J Public Health. 1991 Nov:81(11):1415-22

Russell MA., 1973, Changes in cigarette price and consumption by men in Britain, 1946-71: a preliminary analysis. Br J Prev Soc Med.;27(1):1-7.

Sato H, Araki S, Yokoyama K., 2000, Influence of monopoly privatization and market liberalization on smoking prevalence in Japan: trends of smoking prevalence in Japan in 1975-1995. Addiction. ;95(7):1079-88.

Schweinhart, L. J., Barnes, H. V., Weikart, D. P. , 1993, Significant benefits: The High/Scope Perry Preschool study through age 27 Monographs of the High/Scope Educational Research Foundation, 10. Ypsilanti: High/Scope Press

Stice E, Barrera M, 1995, A Longitudinal Examination of the Reciprocal Relations Between Perceived Parenting and Adolescents' Substance Use and Externalizing Behaviours, Developmental Psychology, vol 31. no 2, pp322-334

Strawbridge WJ. Cohen RD, Shema SJ, Kaplan GA, 1997, Frequent Attendance at Religious Services and Mortality over 28 years. American Journal of Public Health, 87, pp957-961

Tagliacozzo R, Vaughn S, 1982. Stress and Smoking in Hospital Nurses, American Journal of Public Health, vol 72, no 5, pp441-448

Todd G. F. ,1959, Statitistics of Smoking, Tobacco Manufacturers Standing Committee

Todd G. F. ,1975, Changes in smoking patterns in the UK, Tobacco Reserach Council

Tuinstra J, Groothoff JW, van den Heuvel WJA, Post D, 1998. Socio-Economic Differences in Health risk Behaviour in Adolescence: do they exist? Soc. Sci. Med. 47,1, pp67-74

Tyas SL, Pederson LL, 1998. Psychosocial factors related to adult smoking: a critical review of the literarture. Tobacco Control. 7, pp409-420

US Department of Health and Human Services, 1994, Preventing tobacco use among young people. A report of the Surgeon General. Public Health Service. Centers for Disease Control and Prevention, Office on Smoking and Health

Waldron I., 1991, Patterns and causes of gender differences in smoking. Soc Sci Med. ;32(9):989-1005.

Walker R. B.. 1980. Medical aspects of tobacco smoking and the anti-tobacco movement in Britain in the nineteenth century, Medical History, 24, 391-402

Wark M, 1986, Encouraging the provision of no-smoking tables in restaurants, Health Education Journal, 45(4): 219-221

Wildeblood J., Brinson P., 1965, The Polite World, OUP

Wolfinger NH, 1998, The Effects of parental Divorce on Adult Tobacco and Alcohol Consumption. Journal of Health and Social Behaviour, 39, pp254-269

Wu L-T, Anthony JC, 1999, Tobacco Smoking and Depressed Mood in late Childhood and Early Adolescence, American journal of Public Health, 89,12,pp1837-1840

Yu Z, Nissinen A, Vartiainen E, Song G, Guo Z, Tian H., 2000, Changes in cardiovascular risk factors in different socioeconomic groups: seven year trends in a Chinese urban population. J Epidemiol Community Health ;54(9):692-6.

Chapter 5

Anderson R, 1983. How have people changed their health behavoiur? Health Education Journal, vol 42, no 3. pp82-86

Aro S, Rasanen L, Telama R., 1986, Social class and changes in health-related habits in Finland in 1973-1983.. Scand J Soc Med. ;14(1):39-47

Barr A, 1998, Drink a Social History, Pimlico

Bartley M. Sacker A, Firth D, Fitzpatrick R., 1999, Understanding social variation in cardiovascular risk factors in women and men: the advantage of theoretically based measures. Soc Sci Med. ;49(6):831-45

Beckman L. J., 1978, Sex-Role Conflict in Alcoholic Women : Myth or Reality, Journal of Abnormal Psychology. Vol 87, no 4, 408-417

Breeze E,1985, Women and Drinking, OPCS

Britton A. McPherson K, 2001, Mortality in England and Wales attributable to current alcohol consumption, J Epidemiol Community Health 55. 383-388.

Browne G. 1950. Patterns of British Life, Hulton Press Ltd

Caetano R. Clark CL, 1998. Trends in alcohol consumption patterns among whites, blacks and hispanics:1984-1995, J Stud Alcohol; 59(6):659-68

Carr-Saunders A. M., Caradog Jones D, Moser C. A , 1958, A survey of Social Conditions in England and Wales. Oxford

Caruna S, Cowley JCP, Rutherford D, 1978, Teaching about alcohol and drinking, TACADE

Central Statistical Office, 1960, Annual Abstract of Statistics, No 97, 1960, London. HMSO

Central Statistical Office, 1969, Annual Abstract of Statistics, No 106, 1969, London, HMSO

Central Statistical Office. 1980, Annual Abstract of Statistics, 1980 Edition, London. HMSO

Central Statistical Office, 1991, Annual Abstract of Statistics, 1991, No 127, London, HMSO

Cooper ML, Russell M, Frone MR., 1990. Work stress and alcohol effects: a test of stress-induced drinking.J Health Soc Behav. ;31(3):260-76

Corrao G. Rubbiati L, Bagnardi V, Zambon A, Poikolainen K., 2000, Alcohol and coronary heart disease: a meta-analysis. Addiction. ;95(10):1505-23

Davies J, Stacey B,1973, Teenagers and Alcohol - A developmental Study in Glasgow, HMSO

Davison C. Smith GD, Frankel S, 1991, Lay epidemiology and the prevention paradox: the implications of coronary candidacy for health education, Sociology of Health and Illness, 13(1):1-19

Department of Health. 1992, The health of the nation – a strategy for health in England. HMSO

Department of Health, 1995, Inter-Departmental Working Group. Sensible drinking. London:

Department of Health. 1998, Our Healthier Nation: A contract for health, The Stationary Office

Department of Health and Social Security, 1981, Drinking Sensibly, HMSO, London

Dight S E ,1976, Scottish Drinking Habits, HMSO

Dingle AE, 1980, The Campaign for Prohibition in Victorian England, Croom Helm

Dooley D. Prause J. 1998, Underemployment and alcohol misuse in the National Longitudinal Survey of Youth. J Stud Alcohol.;59(6) 669-80

Dorn N, 1983, Alcohol, Youth and the State, Croom Helm

Douglas, M, 1987, Constructive drinking. perspectives on drink from anthropology, Cambridge, Cambridge University Press

Dufouil, Ducimetiere P, Alperovitch A, 1997, Sex Differences in the Association between alcohol consumption and Cognitive performance, American Journal of Epidemiology, vol 146, no 5, pp405-412

Dufour MC., 2001, If You Drink Alcoholic Beverages Do So in Moderation: What Does This Mean? J Nutr..131(2):552S-561S

Edwards G, Chandler J, Hensman C, 1972, Drinking in a London Suburb, Quart J Stud Alc Suppl no 6. 69-93.

Green G. Macintyre S, West P, Ecob R, 1991, Like parent like child? Associations between drinking and smoking behaviour of parents and their children, Br J Addict.;86(6):745-58

Greenfield TK. Midanik LT. Rogers JD., 2000, A 10-year national trend study of alcohol consumption, 1984-1995: is the period of declining drinking over? Am J Public Health. 90(1):47-52

Hajema K-J, Knibbe RA, 1998. Changes in social roles as predictors of changes in drinking behaviour, Addiction. 93(11):1717-27

Hammer T. Vaglum P. 1989, The Increase in Alcohol Consumption among Women: a phenomenon related to accessibility or stress? A general population study. Br J Addict.;84(7):767-75

Hannon R, Buler CO, Day CL, Khan SA, Quitoriano LA, Butler AM, Meredith LA. ,1987, Social Drinking and cognitive functioning in college students: A replication and reversibility study. J. Stud. Alcohol.48:502-506

Hannon R, Day CL, Khan SA, Butler AM, Larson AJ, Casey MB, 1983, Alcohol consumption and cognitive functioning in college students. J. Stud. Alcohol,44.283-298

Hansen A. 1986, The portrayal of alcohol on television, Health Education Journal, vol 45, no3, pp127-131

Health Education Council. 1982, Major programmes for 1982-3, HEC, London

Health Education Council, 1984, The Health Education Council Annual Report 1983-4

Health Education Council. 1985, 'That's the Limit', 1985, London, HEC

Holmes SJ. Robins LN. 1987, The influence of childhood disciplinary experience and the development of alcoholism and depression J Child Psychol Psychiat.,28(3):399-415

Hope S. Power C. Rodgers B, 1998. The relationship between parental separation in childhood and problem drinking in adulthood, Addiction, 93(4):505-14

Horton DJ, 1943,The functions of alcohol in primitive societies· A cross-cultural study. Quarterly Journal of Studies on alcohol.4, 199-230

Horwitz AV, White HR, 1991, Becoming married, depression and alcohol problems among young adults, J Health Soc Behav.,;32(3).221-37

Huselid RF, Cooper ML, 1992, Gender Roles as Mediators of Sex Differences in Adolescent Alcohol Use, J Health Soc Behav, 33(4):348-62.

Johnson FW, Gruenewald PJ, Treno AJ, Taff GA., 1998, Drinking over the life course within gender and ethnic groups: a hyperparametric analysis. J Stud Alcohol. ;59(5):568-80.

Karvonen S. Rimpela A. 1996, Socio-regional Context as a determinant of adolescents health behaviour in Finland. Soc Sci Med, 43(10) 1467-74

Knibbe RA, Drop MJ, Van Reek MJ, Saenger G , 1985, The development of alcohol consumption in the Netherlands: 1958-1981.Br J Addict.;80(4) 411-9.

Kubicka L, Csemy L, Duplinsky J, Kozeny J., 1998, Czech men's drinking in changing political climates 1983-93. a three-wave longitudinal study. Addiction. ;93(8).1219-30

Kuh D, Maclean M, 1990, Women's childhood experience of parental separation and their subsequent health and socio-economic status in adulthood, Journal of Biosocial Science, 22, 21-35

Larsen T. 1999. Friends of religious equality: non-conformist politics in mid-Victorian England, The Boydell Press.

Launer LJ, Feskens EJM, Kalmijn S, Kromhout D, 1996, Smoking, drinking and thinking, American Journal of Epidemiology, vol 143, no 3, pp219-227

Lee AJ, Crombie IK, Smith WC, Tunstall-Pedoe H., 1990, Alcohol consumption and unemployment among men: the Scottish Heart Health Study. Br J Addict. Sep;85(9):1165-70

Leonard KE, Rothbard JC, 1999, Alcohol and the Marriage Effect, J Stud Alcohol, Suppl 13:139-46

Lifrak PD. McKay JR. Rostain A, Alterman AI, O'Brien CP, 1997, Relationship of Perceived Competencies. perceived Social Support. and gender to Substance Use in Young Adolescents, J Am Acad Child Adolesc Psychiatry. 36(7):933-40

Linthwaite P, 1987, Alcohol the National Context, Health Education Journal, 46(1):35-36

Luoto R. Poikolainen K, Uutela A, 1998, Unemployment, sociodemographic background and consumption of alcohol before and during the economic recession of the 1990s in Finland, Int J Epidemiol, 27(4):623-9

McGinnis JM, Foege WH, 1993, Actual causes of death in the United States, JAMA ;270(18):2207-12

Midanik L., 1982, The validity of self-reported alcohol consumption and alcohol problems: a literature review. Br J Addict.;77(4).357-82

Miller L Davies M, Greenwald S. 2000. Religiosity and Substance Use and abuse Among Adolescents in the national Comorbidity Survey, J Am Acad Child Adolesc Psychiatry.;39(9).1190-7

Miller-Tutzauer C. Leonard KE, Windle M, 1991, Marriage and Alcohol Use: A longitudinal Study of "Maturing Out", J Stud Alcohol.;52(5).434-40

Nichols JM, Martin F. 1996. The Effect of Heavy Social Drinking on Recall and event related Potentials. J. Stud Alcohol, ,125-135

van Oers JA. Bongers IM. van de Goor LA. Garretsen HF., 1999, Alcohol consumption, alcohol-related problems. problem drinking. and socioeconomic status. Alcohol Alcohol.,34(1):78-88

ONS. 2000, Living in Britain, results from the 1998 General Household Survey, London, The Stationary Office

OPCS, 1990, GHS 1988, London, HMSO

OPCS, 1996, Living in Britian, results from the 1994 General Household Survey, London, HMSO

Osterberg E, 1995, Strategies with potential to reduce harm, in Alcohol and public policy. evidence and issues. eds HD. Holder and G Edwards, Oxford, OUP

Parker F. B., 1969, Self-role strain and drinking disposition at a pre-alcoholic age level, The journal of Social Psychology, 78, 55-61

Parker E. S., Noble E. P., 1977, Alcohol Consumption and Cognitive Functioning in Social Drinkers, Journal of Studies on Alcohol, vol 38, no 7.pp1224-1232

Parfrey P. S. ,1974. Factors Associated with undergraduate alcohol use, Brit J prev soc Med, 28, 252-257

Pendleton L. Smith C, Roberts JL, 1998, Monitoring alcohol advertisements on television – developing a consenus approach, Health Education Journal, 47(2/3);71-73

Power C, Rodgers B. Hope S , 1999, Heavy alcohol consumption and marital status· disentangling the relationship in a national study of young adults. Addiction. ;94(10):1477-87.

Ricciardelli LA, Williams RJ. Kiernan MJ, 1998, Relation of eating and Drinking to Masculinity and Femininity, The Journal of Social psychology. 138(6).744-52

Robinson D .1976, From drinking to alcoholism: a sociological commentary, John Wiley and Sons

Royal College of General practitioners, 1986, Alcohol a balanced view, The Royal College of general Practitioners, London

Royal College of Physicians of London, 1987, A Great and Growing Evil – the medical consequences of alcohol abuse. Report of a working party, London, Tavistock Puiblications

Royal College of Physicians of London, 1991, Alcohol and the Public Health, London, Macmillan

Royal College of Physicians. Royal College of Psychiatrists, Royal College of General Practitioners, 1995. Alcohol and the heart in perspective

Royal College of Psychiatrists, 1986. Alcohol. Our Favourite Drug, London, Tavistock Publications

Romelsjo A. Lazarus NB, Kaplan GA, Cohen RD, 1991, The relationship between stressful life situations and changes in alcohol consumption in a general population sample, Br J Addict.; 86(2):157-69.

Romelsjo A. Lundberg M., 1996, The changes in the social class distribution of moderate and high alcohol consumption and of alcohol-related disabilities over time in Stockholm County and in Sweden. Addiction.;91(9).1307-23.

Sandberg S, 1990, Beliefs about alcohol, Health Education Journal, vol. 49,2,84-86

Scottish Home and Health Department, 1970, Health Education and Alcohol

Simpura J, 1995. Trends in alcohol consumption and drinking patterns: lessons from worldwide development, in Alcohol and public policy. evidence and issues. eds HD. Holder and G Edwards, Oxford, OUP

Smith C. Pendleton LL. Roberts JL. Kelly T, Smith E, 1989, People's knowledge of alcohol a workplace survey. Health Education Journal, vol. 48.1.33-35

Strawbridge WJ. Cohen RD. Shema SJ. Kaplan GA. 1997. Frequent Attendance at Religious Services and Mortality over 28 years, Am J Public Health .87(6) 957-61

Temple MT, Fillimore KM. Hartka E. Johnstone B. Leino EV, Motoyoshi M, 1991, A meta-analysis of change in marital and employment status as predictors of alcohol consumption on a typical occasion. Br J Addict.,86(10) 1269-81

Vasey DE ,1990, The Pub and English Social Change, AMS Press

Wilson P, 1980,Drinking in England and Wales, HMSO

Chapter 6

Aro S, Rasanen L, Telama R., 1986, Social class and changes in health-related habits in Finland in 1973-1983., Scand J Soc Med. ;14(1):39-47

Atkinson P, 1985, Strong minds and Weak Bodies: Sports, Gymnastics and the Medicalization of Women's Education. The British Journal of Sports History, 2, 1, pp62-71

Bartley M, Sacker A, Firth D, Fitzpatrick R., 1999, Understanding social variation in cardiovascular risk factors in women and men: the advantage of theoretically based measures, Soc Sci Med. ; 49(6):831-45

Bennett S, 1995, Cardiovascular risk factors in Australia. trends in socioeconomic inequalities, Journal of Epidemiology and Community Health, 49, pp363-372

Berridge V, 1999. Health and society in Britain since 1939. Cambridge University Press

Blane D, Hart CL, Smith GD, Gillis CR, Hole DJ Hawthorne VM., 1996, Association of cardiovascular disease risk factors with socioeconomic position during childhood and during adulthood.. BMJ. ;313(7070).1434-8.

Booth ML, Bauman A, Owen N, Gore CJ 1997, Physical activity preferences, preferred sources of assistance, and perceived barriers to increased activity among physically inactive Australians, Prev Med ;26(1) 131-7.

Borrell C, Dominguez-Berjon, Pasarin MI, Ferrando J, Rohlfs I, Nebot M, 2000, social inequalities in health related behaviours in Barcelona. J Epidemiol Community Health; 54 : 24-30

Bullough V and Voght M, 1973, Women, Menstruation, and Nineteenth-Century Medicine, Bulletin of the History of Medicine. 47, pp66-82

Bungum TJ, Vincent ML, 1997. Determinants of Physical Activity Among Female Adolescents. American Journal of Preventive Medicine, 13,2 pp115-122

Carr-Saunders A. M., Caradog Jones D, Moser C. A., 1958. A survey of Social Conditions in England and Wales, Oxford

Carron AV, Hausenblas HA, Mack D, 1996. Social Influence and exercise: a meta-analysis. Journal of Sport and Exercise Psychology, 18, 1-16

Charlton J, Murphy M (eds.). 1997. The health of adult Britain 1841-1994. Vol. 1. Decennial supplement No 12. the Stationary Office

Chinn DJ, White M, Harland J, Drinkwater C, Raybould S, 1999. Barriers to physical activity and socio-economic position: implications for health promotion. J Epidemiol Community Health, 53, 191-2

Cohen S, Schwartz JE, Bromet EJ, Parkinson DK., 1991. Mental health, stress, and poor health behaviors in two community samples., Prev Med. ,20(2) 306-15

Colker R and Widom CS, 1980. Correlates of Female Athletic Participation: Masculinity, Feminity, Self Esteem, and Attitudes Toward Women, Sex Roles, 6, 1, pp47-58

Cooper KH, Pollock ML, Martin RP, White SR, Linnerud AC, Jackson A., 1976. Physical fitness levels vs selected coronary risk factors A cross-sectional study. JAMA.,236(2) 166-9

Crespo CJ, Ainsworth BE, Keteyian SJ, Heath GW, Smit E., 1999, Prevalence of physical inactivity and its relation to social class in U S. adults: results from the Third National Health and Nutrition Examination Survey, 1988-1994 , Med Sci Sports Exerc ,31(12) 1821-7

Crespo CJ, Smit E, Andersen RE, Carter-Pokras O, Ainsworth BE, 2000, Race/Ethnicity, Social Class and their Relation to Physical Inactivity During Lesiure Time; Results from the Third National Health and Nutrition Examination Survey, 1988-1994, American Journal of Preventive Medicine, 18,1,pp46-53

Davison LE, 1980, An analysis of knowledge, beliefs and behaviour relating to the development of coronary heart disease, The Health Education Journal, 39,4,p103-109

Department of the Environment, 1975, Sport and Recreation, HMSO, Cmnd 6200

Department of Health, 1992, The health of the nation – a strategy for health in England, HMSO

DiLorenzo TM, Bargman EP, Stucky-Ropp R, Brassington GS, Frensch PA, LaFontaine T., 1999, Long-term effects of aerobic exercise on psychological outcomes., Prev Med. ;28(1):75-85

Donovan JE, Jessor R, Costa FM., 1991, Adolescent health behavior and conventionality-unconventionality: an extension of problem-behavior theory. Health Psychol ;10(1):52-61

Droomers M, Schrijvers CTM, van de Mheeen H, Mackenbach JP, 1998, Educational Differences in Leisure-Time Physical Inactivity: A Descriptive and Explanatory Study, Soc. Sci. Med., vol 47, no 11, pp1665-1676

Eisenberg C, 1990, The Middle Class and Competion: Some Considerations of the Beginnings of Modern Sport in England and Germany, The International Journal of the History of Sport, 7,2, pp265-282

Eyler AA, Brownson RC, Donatelle RJ, King AC, Brown D, Sallis JF., 1999, Physical activity social support and middle- and older-aged minority women: results from a US survey.,Soc Sci Med. ; 49(6):781-9.

Ferrie JE, Shipley MJ, Marmot MG, Stansfeld S, Smith GD., 1995, Health effects of anticipation of job change and non-employment: longitudinal data from the Whitehall II study. BMJ. ;311(7015):1264-9

Fox KR., 1999, The influence of physical activity on mental well-being. Public Health Nutr. ;2(3A):411-8.

Fentem PH, Bassey EJ, 1978, The Case for Exercise, Sports Council Working Party Papers No 8

Gratton C and Taylor P, 1991, Government and the Economics of Sport, Longman

Guttman A, 1994, Games and Empires, Columbia University Press

Hellerstedt WL, Jeffery RW, 1997, The Association of Job Strain and Health Behaviours in Men and Women, International Journal of Epidemiology, 26,3,pp575-583

Holt R, Mason R, 2000, Sport In Britain, Blackwell

Hochstetler SA, Rejeski WJ, Best DL, 1985, The influence of sex-role Orientation on Ratings of Percieved Exertion, Sex Roles, 12, 7/8, pp825-835

Karvonen S, Rimpela A, 1996, Socio-regional Context as a determinant of adolescents health behaviour in Finland. Soc. Sci. Med., vol 43, no 10, pp1467-1474

Kavussanu M, McAuley E, 1995, Exercise and Optimism : are Highly Active Individuals More Optimistic? Journal of Sport and Exercise Psychology, 17, 246-258

Kivela SL, Pahkala K.. 1991, Relationships between health behaviour and depression in the aged. Aging (Milano) ;3(2):153-9

Kivimaki M, Vahtera J, Pentti J, Ferrie JE, 2000, Factors underlying the effect of organisational downsizing on health of employees: longitudinal cohort study.
BMJ ,320(7240):971-5.

Kuh DJL, Cooper C, 1992, Physical activity at 36 years : patterns and childhood predictors in a longitudinal study, Journal of Epidemiology and Community Health, 46 p114-119

Lakka TA, Kauhanen J, Salonen JT., 1996, Conditioning leisure time physical activity and cardiorespiratory fitness in sociodemographic groups of middle-ages men in eastern Finland. Int J Epidemiol.;25(1):86-93

Langmaid WO, 1978, Health Education in North Yorkshire Junior Schools, The Health Education Journal, 37,4,121-127

Leary MR, 1992, Self-Presentation Processes in Exercise and Sport, Journal of Sport and Exercise Psychology, vol 14, no 4, pp339-351

Lee C., 1993. The definition and assessment of physical activity in cardiovascular risk reduction research. Aust J Public Health. ;17(3):190-4

Leino M, Porkka KVK, Raitakari OT, Laitinen S, Taimela S, Viikari JSA, 1996, Influence of Parental Occupation on Coronary Heart Disease Risk Factors in Children. The Cardiovascular Risk in Young Finns Study, International Journal of Epidemiology, vol 25,6,pp1189-1195

Lenskyj H, 1986, Out of Bounds, The Women's Press

Liddiard M, 1944, The mothercraft manual, J&A Churchill

Linthwaite P, 1985, Great British Fun Run, Health Education Journal, 44, 4, p219

Lynch JW, Kaplan GA, Salonen JT., 1997, Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stages of the socioeconomic lifecourse. Soc Sci Med.;44(6):809-19

McCrone KE, 1986, The 'Lady Blue' : Sport at the Oxbridge Women's Colleges from their Foundation to 1914, British Journal of Sports History, 3,2, pp191-215

McCrone KE, 1988, Sport and the Physical Emancipation of English Women, Routledge

McCrone KE, 1990,Emancipation or recreation? The development of women's sport at the University of London, The International Journal of the History of Sport, 7,2 pp204-229

McGinnis JM, Foege WH, 1993, Actual causes of death in the United States, JAMA ;270(18).2207-12

McKibben R, 1998, Classes and Cultures in England 1918-1951, OUP

McLeod H, Religion and Society in England, 1850-1914, Macmillan Press Ltd

McKibben R, 1998, Classes and Cultures in England 1918-1951, OUP

Malcomson RW, 1984, Sports in Society: A historical perspective, The British Journal of Sports History, 1, 1, pp60-72

Mangan JA, 1989, The Social Construction of Victorian Feminity: Emancipation, Education and Exercise, The International Journal of the History of Sport, 6, pp1-9

Maryon Davis A, 1987, Heart Health Campaigns, Health Education Journal, vol 46, no 1, pp3-10

van de Mheen H, Stronks K, Looman CWN, Mackenbach JP, 1998, Does childhood socio-economic status influence adult health through behavioural factors? International Journal of Epidemiology, 27, pp431-437

Miller KE, Sabo DF, Farrell MP. Barnes GM, Melnick MJ, 1998, Athletic Participation and sexual Behaviour in Adolescents: The Different Worlds of Boys and Girls, Journal of health and social behaviour, 39, 108-123

Milligan RA, Burke V, Beilin LJ, Richards J, Dunbar D, Spencer M, Balde E, Gracey MP., 1997, Health-related behaviours and psycho-social characteristics of 18 year-old Australians., Soc Sci Med.;45(10):1549-62

Morris JN, Heady JA, 1953, Mortality in relation to physical activity at work, Br J Ind Med; 10; 245-254

Morris JN, Chave SP, Adam C, Sirey C, Epstein L, Sheehan DJ., 1973, Vigorous exercise in leisure-time and the incidence of coronary heart-disease., Lancet. ;1(7799):333-9.

Moynihan M, Jones AK, Stewart GT, Lucas RW,1980, Knowledge of health information and services in a random sample of the population of Glasgow, Health Education Journal, 39,1,p19-22

Munrow AD, 1972, Physical education: a discussion of principles, London: Bell

Nelson MB, 1994, The stronger women get, the more men love football : sexism and the culture of sport, The Women's Press

OPCS, 1985. GHS 1983. HMSO

OPCS, 1976, The GHS 1973, London, HMSO

OPCS, 1992, GHS 1990, HMSO

Osler M, Gerdes LU, Davidsen M, Bronnum-Hansen H, Madsen M, Jorgensen T, Schroll M., 2000, Socioeconomic status and trends in risk factors for cardiovascular diseases in the Danish MONICA population, 1982-1992. J Epidemiol Community Health. ;54(2):108-13

Paffenbarger RS, Wing AL, Hyde RT., 1978, Physical activity as an index of heart attack risk in college alumni., Am J Epidemiol.;108(3):161-75

Philipp R, Hughes A, Mackley F, Fletcher G, 1988, Public awareness of healthy lifestyle factors and sources of advice, Health Education Journal, 47,1,p26-28

Pomerleau J, McKee M, Robertson A, Vaasc S, Kadziauskiene K, Abaravicius A, Bartkeviciute R, Pudule I. Grinberga D., 2000, Physical inactivity in the Baltic countries., Prev Med. ;31(6):665-72.

Prentice AM. Jebb SA., 1995, Obesity in Britain: gluttony or sloth? BMJ. ;311(7002):437-9.

Randall MW, 1955, Modern Ideas on Physical Education. G Bell & sons

Rayner M, Heughan A, Pearson G, Brunner E, 1990, Why don't people living in Hackney take more exercise? Health Education Journal; 49(2);64-68

Rees C, 1980, Analysis of a fun run, Health Education Journal, 39, 2, pp54-57

Rowntree SB , Lavers GR, 1951, English Life and leisure, Longmans, Green and Co.

Ryckman RM and Hamel J, 1992, Female Adolescents' Motives related to involvement in organised Team Sports, Int. J. Sport Psychol.,23: 147-160

Salmon J, Owen N, Bauman A, Schmitz MK, Booth M., 2000, Leisure-time, occupational, and household physical activity among professional, skilled, and less-skilled workers and homemakers. Prev Med.;30(3).191-9.

Shewry MC, Smith WCS, Tunstall-Pedoe H, 1990, Health knowledge and behaviour change: a comparison of Edinburgh and north Glasgow, Health Education Journal, vol 49, no 4, pp185-190

Sillitoe KK, 1969. Planning for Lesiure, HMSO

Stephens T, 1987, Secular Trends in Adult Physical Activity: Exercise Boom or Bust? Research Quarterly for Exercise and Sport, vol 58, no 2, pp94-105

Sternfeld B, Ainsworth BE, Quesenberry CP., 1999, Physical activity patterns in a diverse population of women. Prev Med.;28(3):313-23

Sports Council, 1981, Look After Yourself!, Sports Council

Stote D, 1936, The Bride's Book, The Bride's Book Company Limited.

Strawbridge WJ, Cohen RD, Shema SJ, Kaplan GA, 1997, Frequent Attendance at Religious Services and Mortality over 28 years, American Journal of Public Health, 87, pp957-961

Stronegger WJ, Freidl W, Rasky E., 1997, Health behaviour and risk behaviour: socioeconomic differences in an Austrian rural county. Soc Sci Med. ;44(3):423-6.

Trost SG, Pate RR, Ward DS, Saunders R, Riner W., 1999, Correlates of objectively measured physical activity in preadolescent youth., Am J Prev Med. ;17(2):120-6.

Tuinstra J, Groothoff JW, van den Heuvel WJA, Post D, 1998, Socio-Economic Differences in Health risk Behaviour in Adolescence: do they exist? Soc. Sci. Med. 47,1, pp67-74

Uitenbroek DG, Kerekovska A, Festchieva N., 1996, Health lifestyle behaviour and socio-demographic characteristics. A study of Varna, Glasgow and Edinburgh., Soc Sci Med. ;43(3):367-77

Vilhjalmsson R, Thorlindsson T, 1998, Factors relating to physical activity: a study of adolescents, Soc. Sci. Med., vol 47 , no 5, pp665-675

Walker H, 1985, The Popularisation of the Outdoor Movement, 1900-1940, The British Journal of Sports History, vol 2,2, pp140-153

Walvin J, 1984, Sport, Social History and the Historian, British Journal of Sports History, 1, 5-13

Wankel LM, Mummery WK, Stephens T, Craig CL, 1994, Prediction of Physical Activity Intention From Social Psychological Variables : Results from the Campbell's Survey of Well-Being, Journal of Sport and Exercise Psychology, 16, 56-69

Welshman J, 1996. Physical Education and the School Medical service in England and wales, 1907-1939, Social History of Medicine, 9, pp31-48

Williams A, 1987, Health and Fitness in the physical education curriculum: regression or progression? Health Education Journal, 46, 3, pp103-107

Wilcox S, Castro C, King AC, Housemann R, Brownson RC., 2000, Determinants of leisure time physical activity in rural compared with urban older and ethnically diverse women in the United States. J Epidemiol Community Health. ;54(9):667-72

Wold B and Anderssen N, 1992, Health promotion Aspects of Family and Peer Influences on Sport Participation, Int. J. Sport Psycholo.,23: 343-359

Zweig F, 1952, Women's Life and Labour, Victor Gollanz, London

Chapter 7

Abbott J, Berry N, 1989,, Personal attribution for myocardial infarction and life-style prior to the event, Health Education Journal, 48,2,77-82

Allison KW, Burton L, Marshall S, Perez-Febles A, Yarrington J, Kirsh LB, Merriwether-DeVries C, 1999, Life Experiences among Urban Adolescents: Examining the Role of Context, Child Development, 70, 4, pp1017-1029

Anderson A S, Hunt K, 1992, Who are the healthy eaters? Eating patterns and health promotion in the West of Scotland, Health Education Journal, 51,1, 3-10

Anderson D, 1985, Interfering unrealistic know-alls? The image and reality of health educators, Health education Journal, 44.1 43

Backett K, 1990, Image and reality health Enhancing behaviours in middle class families, Health Education Journal, 49, 2, 61-63

Black A. E., Billewicz W Z, Thomson A. M., 1976, The diets of pre-school children in Newcastle upon Tyne 1968-71, British Journal of Nutrition, 35, 105-113

Black AE, Ravenscroft C, Sims AJ, 1984, The NACNE Report: Are dietary goals realistic? Comparisons with the dietary patterns of dieticians, Hum. Nutr.: Appl Nutr., 38A, pp165-180

Blaxter M, 1989, Health and Lifestyles, Tavistock/Routledge

Bennett S, 1995, Cardiovascular risk factors in Australia: trends in socio-economic inequalities, Journal of Epidemiology and Community Health, 49, pp393-372

Bolton-Smith C., Brown C. A., Tunstall-Pedoe H.,1991, Nutrient sources in non-manual and manual occupational groups. Results form the Scottish Heart Health Study (SHHS), Journal of Human Nutrition and Dietetics, 4, 291-306

Bourdieu P, 1984, Distinction A Social Critique of the Judgment of Taste, Routledge

Boyd-Orr J. B., 1937, Food Health and Income, Macmillan

Braddon FEM, Wadsworth MEJ, Davies JMC, Cripps HA, 1988, Social and regional differences in food and alcohol consumption and their measurement in a national birth cohort, Journal of Epidemiology and Public Health, 42,4,pp341-349

Bransby E.R.,Osborne B, 1953, A Social and Food Survey of the Elderly, Living Alone or as Married Couples, British Journal of Nutrition, 7, 160-180

Burnett J, 1994, The rise and decline of school meals in Britain, 1860-1990, in The Origins and Development of Food Policies in Europe, eds Burnett J, Oddy DJ, Leicester University Press

Cade J., 1992, Diet of adults living in houses in multiple occupation, European Journal of Clinical Nutrition. 46, 795-801

Cade J. Booth S, 1990, 'What can people eat to meet the dietary goals: and how much does it cost?' Journal of Human Nutrition and Dietetics, 3, 199-207

Cannon, 1987, The Politics of Food, London, Century

Carr-Saunders A. M., Caradog Jones D, Moser C. A., 1958, A survey of Social Conditions in England and Wales, Oxford

Charles N, Kerr M, 1988, Women Food and Families, Manchester University Press

Cole-Hamilton I, Gunner K, Leverkus C, Starr J, 1986, A study among dieticians and adult members of their households of the practicalities and implications of following proposed dietary guidelines for the UK, Human Nutrition: Applied Nutrition 40A, 365-389

Cook A, Pryer J, Shetty P, 2000, The Problem of Accuracy in dietary surveys. Analysis of the over 65 UK National Diet and Nutrition Survey, Journal of Epidemiology and Public Health, 54, 611-616

Cook J, Altman D. G., Moore D. M. C., Toop S. G, Holland W. W., Elliott A., 1973, A survey of the nutritional status of schoolchildren, British Journal of preventive and social Medicine, 27, 91-99

Davison C, Smith GD, Frankel SJ, 1991, Lay Epidemiology and the Prevention Paradox – the implications of coronary candidacy for health education, Sociology of Health and Illness, 13, pp1-19

Department of Health and Social Security, 1976, Nutrition Education, HMSO

Department of Health and Social Security, 1978, Prevention and Health: Eating for Health, HMSO

Department of Health and Social Security, 1984, Diet and cardiovascular disease. report of the Panel on Diet in Relation to Cardiovascular Disease, Committee on Medical Aspects of Food Policy, London. HMSO

Douglas M, Nicod M, 1974, Taking the biscuit the structure of British meals, New Society, 19 December 1974, 744-747

Durnin JVGA, Lonergan M E, Good J, Ewan A, 1974, British Journal of Nutrition 32, pp169-179

Elwood P C, Bird G, Hughes S J, Fehily A M, 1990, 'The nutrient intakes of women : dietary surveys in 1966 and 1983 compared, Journal of Human Nutrition and Dietetics, 3:33-37

Fehily A. M., Barker M. E., Thomson M., Yarnell W. G., Holliday R.M., Thompson K.A., Elton R., Bainton D., Baker I.A., (1990), The diets of men in four areas of the UK: Caerphilly, Northern Ireland, Edinburgh and Speedwell studies, European Journal of Clinical Nutrition, 44, 813-817

Feirstein B, 1982, Real Men Don't Eat Quiche, New English Library

Fiddes N, 1991, Meat, a natural symbol, Routledge

Fine B, Heasman M, Wright J, 1998, What we eat and why: social norms and systems of provision, in The Nation's Diet : the social science of food choice, ed Murcott A, Longman

Flynn A, Harrison M, Marsden T, 1998, Regulation, rights and the structuring of food choices, in The Nation's Diet : the social science of food choice, ed Murcott A, Longman

Frankel S, Davison C, Davey-Smith G, 1991, Lay epidemiology and the rationality of responses to health education, British Journal of General Practise, 41, pp428-430

Gibney M J, 1990, Dietary guidelines: a critical appraisal, Journal of Human Nutrition and Dietetics, 3, 245-254

Gibney MJ, Lee P, 1991, Formulation of practical advice for reducing dietary fat intakes in unemployed in Dublin, Journal of Human Nutrition and Dietetics, 4. 179-184

Graham H, 1996. Smoking prevalence among women in the European Community 1950-90, Soc. Sci. Med., 43, pp243-254

Gregory J, Foster K, Tyler H, Wiseman M, 1990, The dietary and Nutritional survey of British adults, OPCS, HMSO

Hackett A. F., Rugg-Gunn A. J., Appleton D. R., Eastoe J. E, Jenkins G. N., 1984, A 2-year longitudinal survey of 405 Northumberland children initially aged 11.5 years, British Journal of Nutrition, 51, 67-75

Harris J, Benedict F 1919, A biometric study of basal metabolism in man. Washington D.C. Carnegie Institute of Washington.

Hellerstedt WL, Jeffery RW, 1997, The Association of Job Strain and Health Behaviours in Men and Women, International Journal of Epidemiology, 26,3,pp575-583

Holm L, 1993, Cultural and social acceptability of a health diet, European Journal of Clinical Nutrition, 47, 592-599

Hulshof KFAM, Lowik MRH, Kok FJ, Wedel M, Branst HAM, Hermus RJJ, ten Hoor F, 1991, Diet and other lifestyle factors in high and low socio-economic groups (Dutch National Surveillance System), European Journal of Clinical Nutrition, 45, 441-450

Jacoby A, Altman D G., Cook J, Holland W. W , Elliott A., 1975, Influence of some social and environmental factors on the nutrient intake and nutritional status of schoolchildren, British Journal of preventive and social Medicine, 29, 116-120

Karvonen S, Rimpela A, 1996, Socio-regional context as a determinant of adolescents health behaviour in Finland, Soc. Sci. Med., 43, 10, pp1467-1474

Leino M, Raitakari OT, Porkka KVK, Taimela S, Viikari JSA, 1999, Associations of education with cardiovascular risk factors in young adults: The Cardiovascular Risk in Young Finns Study, International Journal of Epidemiology, 28, 667-675

Leino M, Porkka KVK, Raitakari OT, Laitinen S, Taimela S, Viikari JSA, 1996, Influence of Parental Occupation on Coronary Heart Disease Risk Factors in Children. The Cardiovascular Risk in Young Finns Study, International Journal of Epidemiology, vol 25,6,pp1189-1195

Lupton D, 2000, The heart of the meal: food preferences and habits among rural Australian couples, Sociology of Health and Illness, 22,1, pp94-109

Lytton Toye D, 1957, Eat and grow slender, Vogue , p69 and p94

McGinnis JM, Foege WH, 1993, Actual causes of death in the United States, JAMA ;270(18):2207-12

McGuffin, S J, 1986, The nutritional knowledge and behaviour of 11 to 16 year old school pupils in Northern Ireland, Health Education Journal, 45,3,155-159

Mennell S, 1992, Sociology of Food : Eating, Diet and Culture, Sage

Mela DJ, 1993, Consumer Estimates of the percentage energy from fat in common foods, European Journal of Clinical Nutrition, 47, 735-740

Ministry of Agriculture, Fisheries and Food, 1991, Fifty years of the National Food Survey, 1940-1990, HMSO

Mooney C, ,1990, Cost and availability of healthy food choices in a London health district, Journal of Human Nutrition and Dietetics, 3, 111-120

Mintz SW, 1997, Tasting Food, Tasting Freedom : Excursions into Eating, Culture, and the Past, Beacon Press.

Morgan M, Heller RF, Swerdlow A., 1989, Changes in diet and coronary heart disease mortality among social classes in Great Britain. J Epidemiol Community Health. ;43(2):162-7.

National Advisory Committee on Nutrition Education, (1983), A discussion paper on proposals for nutritional guidelines forhealth education in Britain, The Health Education Council

Nelson M, 1985, Nutritional Goals from COMA and NACNE: How can they be achieved? Hum. Nutr.: Appl Nutr., 39a pp456-464

Nelson M, 1986, The distribution of nutrient intake within families, British Journal of Nutrition, 55, 267-277

Nelson M, 1993, Social-class trends in British diet, 1860-1980, in Food, Diet and Economic Change Past and Present, edited Geissler C, Oddy D. J., Leicester University Press

Osler M, Gerdes LU, Davidsen M, Bronnum-Hansen H, Madsen M, Jorgensen T, Schroll M, 2000, Socioeconomic status and trends in risk factors for cardiovascular disease in the Danish MONICA population, 1982-1992, Journal Epidemiology and Public Health, 54, pp108-113

Pill R, Parry O, 1989, Making changes – women, food and families, Health Education Journal, 48,2, pp51-4

Pill R, Stott NCH, 1985, Choice or chance. Further Evidence on ideas of illness and responsibility for health, Soc. Sci. Med., 20, 10, pp981-991

Price GM, Paul AA, Cole TJ, Wadsworth MEJ, 1997, Characteristics of the low energy reporters in a longitudinal national diet survey. British Journal of Nutrition 77, 833-851.

Pryer JA, Vrijheid M, Nichols R, Kiggins M, Elliott P, 1997, Who are the 'Low Energy Reporters' in the Dietary and Nutritional Survey of British Adults, International Journal of Epidemiology, 20,1, pp146-154

Prynne CJ, Paul AA, Price GM, Day KC, Hilder WS. Wadsworth MEJ, 1999, Food and nutrient intake of a national sample of four year old children in 1950: comparison with the 1990s. Public Health Nutrition 2, 537-547.

Richardson J, Grigg J, 1987, Promoting nutrition education in Worcester, Health Education Journal, 46, 1, pp25-26

Roos E. Prattala R, Lahelma E, Kleemola P, Pietinen P, 1996, Modern and healthy? Socio-economic differences in the quality of diet, European Journal of clinical Nutrition, 50, pp753-760

Roos E, Lahelma E, Virtanen M, Prattala R, Pietinen P, 1998, Gender, Socio-Economic Status and family as determinants of food behaviour, Soc Sci Med, 46,12, pp1519-1529

Shepherd R., Towler G, (1992), Nutrition knowledge, attitudes and fat intake: application of the theory of reasoned action, Journal of Human Nutrition and Dietetics, 5, 387-397

Shepherd R, Farleigh CA, 1986, Preferences, Attitudes and Personality as Determinants of Salt Intake, Human Nutrition, Applied Nutrition, 40A, pp195-208

Sorensen G, Stoddard A, Macario E, 1998, Social Support and Readiness to Make Dietary Changes, Health Education and Behaviour, 25,5, pp586-598

Smith D, 1998, The discourse of scientific knowledge of nutrition and dietary change in the twentieth century. in The Nation's Diet : the social science of food choice, ed Murcott A, Longman

Smith DF (ed), 1997, Nutrition in Britain, Routledge

Steptoe A, Wardle J, Lipsey Z, Oliver G, Pollard TM, Davies GJ, 1998, The effects of life stress on food choice in The Nation's Diet : the social science of food choice, ed Murcott A, Longman

Stone AA, Brownell KD, 1994, The Stress-Eating Paradox: Multiple Daily Measurements in Adult Males and Females, Psychology and Health, 9, pp425-436

Stubenitsky K, Mela DJ., 2000, UK consumer perceptions of starchy foods. Br J Nutr.;83(3):277-85.

Sweeting H, Anderson A, West P, 1994, Socio-demographic correlates of dietary habits in mid to late adolescence, European Journal of Clinical Nutrition, 48, 736-748

Synder R, Hasbrouck L, 1996, Feminist Identity, Gender Traits, and Symptoms of Disturbed Eating among College Women, Psychology of Women Quarterly, 20, pp593-598

Tate J, Cade J, 1990, Public knowledge of dietary fat and coronary heart disease, Health Education Journal, 49, 1,32-35

Thompson B, Skipper D, Fraser C, Hewitt A, Hunter D, 1989 Dietary intake of Aberdeen primigravidae in 1950/51 and 1984 85, Journal of Human Nutrition and Dietetics 2, 345-359

Turner BS, 1982. The government of the body. medical regimens and the rationalization of diet. The British Journal of Sociology, 33,2,pp254-269

Thompson FML (ed) ,1990, The Cambridge Social History of Britain 1750-1950, Cambridge University Press.

Uitenbroek DG, Kerckovska A, Festchieva N, 1996, Health Lifestyle behaviour and socio-demographic characteristics. A study of Varna, Edinburgh and Glasgow, Soc. Sci. Med., 43,3,pp367-377

Veblen, 1994, The theory of the Leisure class, Dover Thrift edition, originally, Macmillan

Wallace P, Cutler S, Haines A, 1988, Perceptions of weight problems and dietary patterns among general practice patients. Health Education Journal, 47,1, 7-11

Whichelow MJ, 1988, Which Foods Contain Dietary Fibre? The beliefs of a random sample of the British Population, European Journal of Clinical Nutrition, 42, 945-951

Wise A, Lockie G. M., Liddell J A, 1986, Effective ways of reducing saturated fat intake, Health Education Journal, 45,4,210-241

UK Margarine & Shortening Manufacturers' Association ,1969, Food Facts and Fallacies

Walker C, Cannon G, 1984, The Food Scandal, Century

Wartime Social Survey, 1942, FOOD, An Inquiry into a typical days meals and attitude to wartime food in selected groups of the English Working Population, New Series 16 & 19

Wickrama KAS, Conger RD, Wallace LE, Elder GH, 1999, The Intergenerational Transmission of health Risk Behaviours: Adolescent lifestyles and Gender Moderating effects, Journal of health and Social Behavior, vol 40, pp258-272

Wrigley N, 1998, How British retailers have shaped food choice, in The Nation's Diet : the social science of food choice, ed Murcott A, Longman

Chapter 8

Anda RF, Croft JB, Felitti VJ, Nordenberg D, Giles WH, Williamson DF, Giovino GA., 1999, Adverse childhood experiences and smoking during adolescence and adulthood. JAMA.; 282(17):1652-8

Anzai Y, Ohkubo T, Nishino Y, Tsuji I, Hisamichi S., 2000, Relationship between health practices and education level in the rural Japanese population. J Epidemiol. ;10(3):149-56

Bartley M, Sacker A, Firth D, Fitzpatrick R., 1999, Understanding social variation in cardiovascular risk factors in women and men: the advantage of theoretically based measures. Soc Sci Med.; 49(6):831-45

Berkman LF, Glass T, Brissette I, Seeman TE, 2000, From social integration to health: Durkheim in the new millennium, Soc. Sci. Med., 51, 843-857

Blane D. Davey Smith G, Bartley M, 1993, Social selection: what does it contribute to social class differences in health? Sociology of Health and Illness; 15; pp1-15

Browne, G., 1950, Patterns of British Life, Hulton Press

Brownson RC. Eyler AA, King AC, Brown DR, Shyu Y-L, Sallis JF, 2000, Patterns and Correlates of Physical Activity Among US Women 40 Years and Older, Am J Public Health, 90(2), 264-70

Caetano R, Clark CL, 1998, Trends in alcohol consumption patterns among whites, blacks and hispanics:1984-1995, J Stud Alcohol; 59(6):659-68

Connor M, Armitage CJ, 1998, Extending the Theory of Planned behaviour: a review and avenues for Further Research, Journal of applied Social Psychology, 28, 15, pp1429-1464

Conrad KM, Flay BR, Hill D, 1992, Why children start smoking cigarettes: predictors of onset, Br J Addict.;87(12):1711-24.

DeGarmo DS. Forgatch MS. Martinez CR, 1999, Parenting of Divorced Mothers as a Link between Social Status and Boys' Academic Outcomes: Unpacking the Effects of Socioeconomic Status, Child Dev. :70(5):1231-45.

Derzon JH, Lipsey MW. 1999, Predicting tobacco use to age 18: a sysnthesis of longitundinal research, Addiction, 94(7):995-1006

Droomers M, Schrijvers CTM, van de Mheeen H, Mackenbach JP, 1998, Educational Differences in Leisure-Time Physical Inactivity: A Descriptive and Explanatory Study, Soc Sci Med,47(11):1665-76

Dwyer JJ, Allison KR, Makin S., 1998, Internal structure of a measure of self-efficacy in physical activity among high school students Soc Sci Med.;46(9):1175-82

Epstein JA, Griffin KW, Botvin GJ., 2000, Competence skills help deter smoking among inner city adolescents. Tob Control. 2000 Mar;9(1):33-9

Epstein JA, Griffin KW, Botvin GJ., 2000, Role of general and specific competence skills in protecting inner-city adolescents from alcohol use J Stud Alcohol.;61(3):379-86.

Equal Opportunities Commission, 1998, Social focus on Women and Men, London, Stationary Office

Ferrence R., 2001, Diffusion theory and drug use. Addiction. ;96(1).165-73.

Flint A. J., Novotny T E., 1997, Poverty status and cigarette smoking prevalence and cessation in the United States, 1983-1993: the independent risk of being poor, Tobacco Control 1997;6,14-18

Giddens A, 1991, Modernity and Self-Identity, Polity Press

Graham H, 1987, Women's smoking and family health, Soc Sci Med, 25(1):47-56.

Graham H, Der G., 1999, Patterns and predictors of tobacco consumption among women. Health Educ Res. ,14(5):611-8.

House of Commons Library, 1999, The Right to Buy, Research Paper 99/36

Hulshof KF, Wedel M, Lowik MR, Kok FJ, Kistemaker C, Hermus RJ, ten Hoor F, Ockhuizen T., 1992, Clustering of dietary variables and other lifestyle factors (Dutch Nutritional Surveillance System). J Epidemiol Community Health.;46(4).417-24.

Jackson C, Henriksen L, Dickinson D, Levine DW., 1997, The early use of alcohol and tobacco: its relation to children's competence and parents' behavior. Am J Public Health. ;87(3):359-64.

Koivusilta L, Rimpela A, Rimpela M, 1998, Health related lifestyle in adolescence predicts adult educational level: a longitudinal study from Finland, J Epidemiol Community Health.; 52(12):794-801

Lindbladh E, Lyttkens CH, Hanson BS, Ostergren PO, 1997, The diffusion model and the social-hierarchical process of change, Health Promotion International, 12,4, pp323-330

Longford NT, Ely M, Hardy R, Wadsworth MEJ, 2000, Handling missing data in diaries of alcohol consumption, J. R. Statist. Soc. A, 163(3):381-402

Loveland-Cherry CJ, Leech S, Laetz VB, Dielman TE., 1996. Correlates of alcohol use and misuse in fourth-grade children: psychosocial, peer, parental, and family factors.
Health Educ Q.;23(4) 497-511.

Lupton D, 1994, Consumerism, commodity culture and health promotion, Health Promotion International, 9,2,pp111-118

Mcleod H, 1996. Religion and Society in England, 1850-1914, Croom-Helm

Macintyre S, Ellaway S, Der G, Ford G, Hunt K, 1998, Do housing tenure and car access predict health because they are simply markers of income or self-esteem? A Scottish Study, J Epidemuol Community Health: 52, pp657-664

Mattisson I, Wirfalt E, Gullberg B, Berglund G., 2001, Fat intake is more strongly associated with lifestyle factors than with socio-economic characteristics, regardless of energy adjustment approach. Eur J Clin Nutr. ;55(6):452-61

Parker G., 1989, The Parental Bonding Instrument psychometric properties reviewed.
Psychiatr Dev.;7(4):317-35.

Sallis JF, Prochaska JJ, Taylor WC., 2000, A review of correlates of physical activity of children and adolescents. Med Sci Sports Exerc.;32(5):963-75

Scheier LM, Botvin GJ, Baker E., 1997, Risk and protective factors as predictors of adolescent alcohol involvement and transitions in alcohol use: a prospective analysis.
J Stud Alcohol.;58(6):652-67

Sparks P, Shepherd R, Wieringa N, Zimmermanns N., 1995, Perceived behavioural control, unrealistic optimism and dietary change: an exploratory study. Appetite.;24(3):243-55.

Twisk JW, Kemper HC, van Mechelen W, Post GB., 1997, Tracking of risk factors for coronary heart disease over a 14-year period. a comparison between lifestyle and biologic risk factors with data from the Amsterdam Growth and Health Study. Am J Epidemiol. ;145(10):888-98.

Wadsworth MEJ, Freeman SR, 1983, Generation differences in beliefs, The British Journal of Sociology, vol XXXIV, no 3, pp416-437

Wilkinson RG, 1999, Putting the picture together: prosperity, redistribution, heath, and welfare, in Social determinants of health, eds. Marmot M, Wilkinson RG, OUP

Young M, Wilmott P, 1986, Family and kinship in East London, London. Routledge, Kegan Paul.

Yu Z, Nissinen A, Vartiainen E, Song G, Guo Z, Tian H., 2000, Changes in cardiovascular risk factors in different socioeconomic groups: seven year trends in a Chinese urban population. J Epidemiol Community Health.;54(9):692-6.

Appendix A

Bank L, Duncan T, Patterson GR, Reid J, 1993, Parent and Teacher Ratings in the Assessment and Prediction of Antisocial and Delinquent Behaviours, Journal of Personality, 61,4, pp693-709

Hair JF, Anderson RE, Tatham RL, Black WC, 1998, Multivariate Data Analysis, Prentice-Hall

Knibbe RA, Drop MJ, Van Reek MJ, Saenger G., 1985, The development of alcohol consumption in the Netherlands: 1958-1981.Br J Addict.;80(4):411-9.

Jones P, Rodgers B, Murray R, Marmot M., 1994, Child development risk factors for adult schizophrenia in the British 1946 birth cohort. Lancet.;344(8934):1398-402.

Kolar DW, Funder DC, Colvin CR, 1996, Comparing the Accuracy of Personality Judgements by the Self and
Knowledgeable Others, Journal of Personality, 64,2, pp311-337

Kruger J, Dunning D, 1999, Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-Assessments, Journal of Personality and Social Psychology, Vol. 77, no 6, pp1121-1134

Lindelow M, Hardy R, Rodgers B. , 1997, Development of a scale to measure symptoms of anxiety and depression in the general UK population: the psychiatric symptom frequency scale. J Epidemiol Community Health.;51(5):549-57.

OPCS, 1980, Classification of Occupations, London, HMSO

OPCS. 1990, Standard Occupational Classifications Vol 1 and Vol 2, London, HMSO

van Os J, Jones P, Lewis G, Wadsworth M, Murray R., 1997, Developmental precursors of affective illness in a general population birth cohort. Arch Gen Psychiatry.;54(7):625-31

Robinson JP, Shaver PR, Wrightsman LS, 1991, Criteria for scale selection and evaluation in Measures of Personality and Social Psychological Attitudes, JP Robinson, PR Shaver and LS Wrightsman (eds), Academic Press

Rodgers B., 1996, Reported parental behaviour and adult affective symptoms 2. Mediating factors. Psychol Med.;26(1):63-77

Rodgers B, Mann SA., 1986, The reliability and validity of PSE assessments by lay interviewers· a national population survey. Psychol Med. ;16(3):689-700.

Appendix B

Wadsworth MEJ, Mann SL, Rodgers B, Kuh DJL, Hilder WS, Yusuf EJ, 1992, Loss and representativeness in a 43 year follow-up of a national birth cohort, J Epidemiol Community Health; 42, pp300-304

Price GM, Paul AA, Cole TJ, Wadsworth MEJ, 1997, Characteristics of the low energy reporters in a longitudinal national diet survey. British Journal of Nutrition 77, 833-851.